# THE COAST ARTILLERY JOURNAL

*Published as the Journal U. S. Artillery from 1892 to 1922*

MAJ. STEWART S. GIFFIN, C. A. C. ..... *Editor*

STAFF SGT. CHARLES R. MILLER, C. A. C. ..... *Business Manager*

Volume 72 | May, 1930 | Number 5

## CONTENTS

MAJOR GENERAL JOHN W. GULICK ..... *Frontispiece*

GREETINGS OF CHIEF OF COAST ARTILLERY TO CORPS ..... 381

MAJOR GENERAL JOHN W. GULICK, CHIEF OF COAST ARTILLERY 382

COMMENTS ON REVISION OF TR 535-55, COAST ARTILLERY TARGET PRACTICE REGULATIONS ..... *By* THE COAST ARTILLERY BOARD 385

JOINT ANTIAIRCRAFT-AIR CORPS EXERCISES AT ABERDEEN PROVING GROUND ..... 403

MECHANIZED MACHINE GUNS ..... *By* MAJ. G. M. BARNES, Ord. Dept. 412

FILTERS AND SOUND LOCATORS ..... *By* MAJ. G. B. ROBISON, C. A. C. 424

COAST ARTILLERY ACTIVITIES ..... 429

*Chief of Coast Artillery attends dinner given by Governor of New York—Cooperation—School details for the year 1930-31—Master Sergeant Mapes retires—The Coast Artillery School—Harbor Defenses of Long Island Sound—Harbor Defenses of Balboa—Harbor Defenses of Honolulu—The 13th Coast Artillery (HD)—The 61st Coast Artillery (AA)—The 62nd, 69th Coast Artillery (AA)—The 18th S. R. Battery—The R. O. T. C. University of Delaware.*

PROFESSIONAL NOTES ..... 446

*Air and Terrestrial Spotting—Training Schedules—Japanese Antiaircraft—Signal Corps develops new type of field wire for the Army—New tow-target release mechanism tested.*

COAST ARTILLERY BOARD NOTES ..... 454

YOU TELL EM ..... 456

*Lieutenant makes wonderful discovery—It won't—Now we'll have to read it—For sale—Maneuvers.*

COAST ARTILLERY ORDERS ..... 460

BOOK REVIEWS ..... 469

*Introduction to Military History—Dreamers of Empire—Commando.*

*Authors alone are responsible for statements in contributed articles*

The COAST ARTILLERY JOURNAL pays for original articles upon publication.

Published monthly under the supervision of the Chief of Coast Artillery for the information of the Coast Artillery personnel of the Regular Army, National Guard, and Organized Reserves.

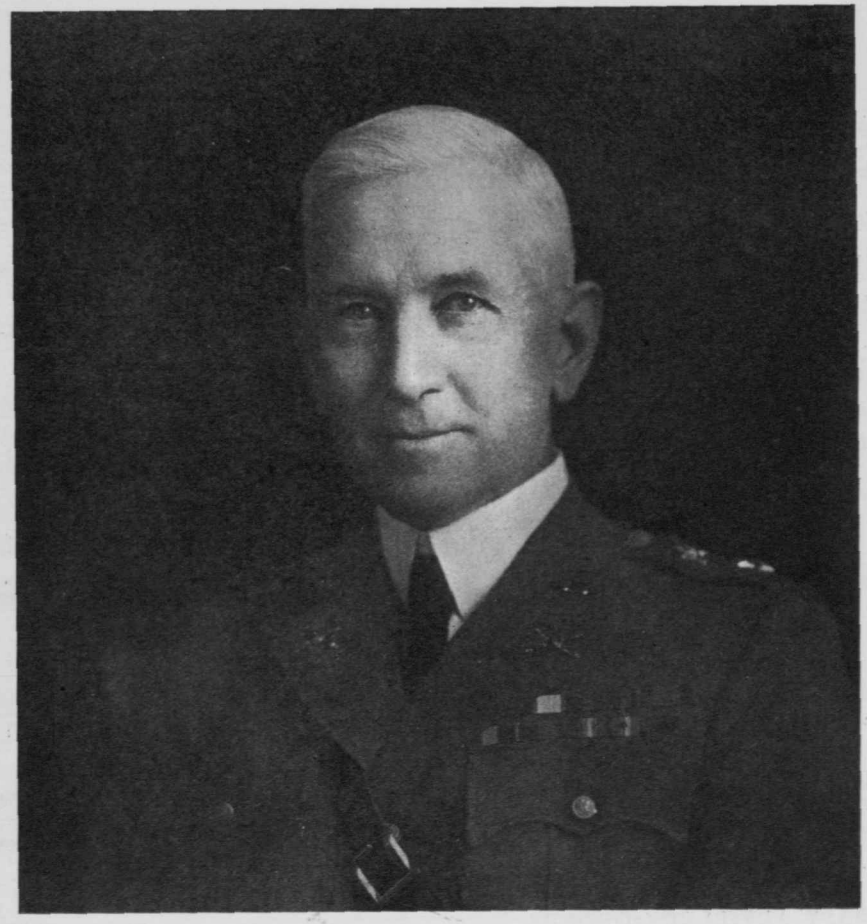
Terms: United States, $3.00 a year; single copies, 50 cents. Canada, $3.25 a year; single copies, 55 cents. Foreign, $3.50 a year; single copies, 60 cents.

Entered as second class matter at the Post Office at Washington, D. C. Acceptance for mailing at special rate of postage provided for in Section 1103, Act of October 3, 1917, authorized May 8, 1920.

Copyright, 1930, by the COAST ARTILLERY JOURNAL.

Address: The COAST ARTILLERY JOURNAL, 1115 17th St., N. W., Washington, D. C.

*Printed by Hayworth Printing Company, Washington, D. C.*



John W. Gulick

Major General, Chief of Coast Artillery

WAR DEPARTMENT

OFFICE OF THE CHIEF OF COAST ARTILLERY

WASHINGTON

TO THE COAST ARTILLERY CORPS:

In assuming the duties of Chief of Coast Artillery I do so with a keen appreciation of the honor conferred upon me and of the responsibilities of the office. It shall be my purpose to continue the program so ably initiated by my predecessor and friend, General Hero, and to maintain the best traditions of the Coast Artillery.

Within the policies established by higher authority, I shall devote myself to the improvement of the general condition, morale and efficiency of the Coast Artillery, and I shall do all in my power to secure for the Coast Artillery its proper place in the Army of the United States, of which it is a most important element. As long as navies exist, and ships carrying guns navigate the seas or the air, an efficient and effective Coast Artillery is essential.

Under the recent reorganization of the Coast Artillery we have a broad and varied peace-time mission demanding personnel of the highest standards, training and efficiency. The magnitude of our mobilization mission is such as to demand that every officer be a potential commander, and that every enlisted man be a potential officer, noncommissioned officer or key man in the new organizations. This is a high ideal and is a challenge to the officers and enlisted men of the Coast Artillery.

I desire to maintain the closest contact with the Coast Artillery organizations of the National Guard, the Organized Reserves and the R. O. T. C., and to cooperate with them to our mutual advantage. I consider duty with the civilian components of first importance, and warranting the assignment to this duty of our best and most efficient officers.

I plan to visit every Coast Artillery station in the United States, the Insular Departments and the Panama Canal at the earliest practicable date, and to examine into their problems on the ground. When this initial survey is completed I shall be pleased to inform you from time to time in more detail of my impressions and ideas as to the training and other matters of interest through the medium of the COAST ARTILLERY JOURNAL.

The Coast Artillery has no place for pessimists. As I see it, we have every reason to view the future with confidence.

*Major General,*
*Chief of Coast Artillery.*

THE COAST ARTILLERY JOURNAL

Volume 72 May, 1930 Number 5

# Major General John W. Gulick

## Chief of Coast Artillery

GENERAL GULICK was born in Goldsboro, North Carolina, November 8, 1874. He attended grade and high school in Goldsboro, afterwards attending engineering courses at various institutions.

His first military experience was obtained in the National Guard of North Carolina in which he enlisted in 1894, serving in the grades of private, sergeant, first sergeant, and first lieutenant. On April 27, 1898, upon the outbreak of the Spanish-American War, he entered the service of the United States as a first lieutenant, North Carolina Infantry, and served as such in Florida and Cuba during the war. When he was mustered out of the service in 1899 he was appointed first lieutenant, 47th U. S. Volunteers, then commanded by Col. Walter Howe (major, 4th Artillery) and ordered to the Philippines. En route, he was promoted and served in the grade of captain during the Philippine campaign. He was acting quartermaster for General Kobbe's expedition to open the Hemp Ports, he participated in the actions at Calbayog and Catbalogan on January 25 and 26, 1900, and in the various actions and skirmishes in and around Gubat, June 1 to November 30, 1900. For gallantry in action near Bulusan, August 10, 1900, he was recommended for the brevet rank of major, U. S. Volunteers.

Captain Gulick returned to the United States July 1, 1901, and was mustered out of the service the following day. He entered the Regular Army as a first lieutenant, Artillery Corps, on August 1, 1901. He served in this grade at Charleston, South Carolina, Havana and Cienfuegos, Cuba, from 1901 to 1903, and in the Artillery District of Portland, Maine, 1903 to 1904.

In August, 1904, Lieutenant Gulick was ordered to duty as a student officer at the Artillery School, Fort Monroe. He was retained as an instructor the next year and remained on this duty until November 11, 1911. During this period (February 16, 1906) he was promoted to the grade of captain.

In November, 1911, Captain Gulick was detailed military attache in Chile and on May 31, 1912, under authority of the War Department and a special Act of Congress, approved May 11, 1911, he accepted the position of instructor and advisor on coast defense with the Chilian Government

with rank of major in the Chilean Army. He served in this capacity until June, 1915. During this detail he established and conducted a gunnery school for the training of Chilean coast artillery troops and carried out a program for the reorganization and rearmament of the coast defenses of that country. The coast artillery gunnery school in Chile is still in operation under the supervision of Chilean officers who attended the Coast Artillery School at Fort Monroe, 1913-1915.

Captain Gulick returned from Chile and was assigned to duty at Fort Monroe where he commanded a battery and served as a member of the Coast Artillery Board. In April, 1916, he was ordered to Fort Oglethorpe, Georgia, and commanded a battalion of Coast Artillery, assisting in the operation of an officers' training camp. On May 10, 1916, he, with two companies of Coast Artillery, was detached and proceeded to El Paso, Texas, for emergency duty on the Mexican border. He was promoted major, July 1, 1916, and assigned to the 5th Provisional Regiment, Coast Artillery Corps, and sent to Del Rio, Texas, remaining until August 25, when he again returned to Fort Monroe. He was assigned to duty with the Coast Artillery School as Director, Department of Artillery, and served as such until he was relieved on June 4, 1917, shortly after the United States entered the World War.

Upon his relief from Fort Monroe, Major Gulick was detailed to the General Staff Corps and assigned to duty with the War College Division in Washington. On August 5, 1917, he was appointed lieutenant colonel, Field Artillery, National Army, and ordered to Camp Kearney, California, as Chief of Staff, 40th Division. On May 18, 1918, he was promoted colonel, National Army, and in July, 1918, accompanied the Division headquarters, 40th Division, to France.

On arrival in France, Colonel Gulick was detached from the 40th Division and assigned to headquarters, Army Artillery, First Army. He served in that capacity during the operations of the First Army in France and was awarded the Distinguished Service Medal, the citation for which reads as follows:

"For exceptionally meritorious and conspicuous services. As Assistant Chief of the Operations Section and later as Chief of Staff of the Army Artillery of the First Army, he demonstrated a keen conception of all of the tactical situations which confronted the artillery of the First Army. By his high professional attainments and sound military judgment he handled the many complex problems of the First Army Artillery, with marked skill, and thereby contributed, in no small degree, to the success of this unit in the St. Mihiel and Meuse-Argonne offensives."

He was also awarded a citation in the Legion of Honor in the grade of officer.

Colonel Gulick returned to the United States in January, 1919, and was assigned to duty in the War Plans Division, War Department General

Staff. He reached the grade of lieutenant-colonel in the Regular establishment on July 1, 1920. He was relieved from the General Staff in July, 1924, to become a student in the Army War College. Upon completion of the course in 1925, he was assigned to duty at Fort Hancock, New Jersey, where he served until March, 1926, being promoted to the grade of colonel August 19, 1925, during this assignment. He again served in Washington as Executive officer in the Militia (Bureau) during the period March 15, 1926, to March 15, 1930, immediately preceding his appointment as Chief of Coast Artillery.

Like his predecessor, the greater part of General Gulick's service has been with the Artillery arm of the service. His high reputation is so well-known in the Corps that to do more than mention it would appear presumptuous. He ascends to the highest position of leadership in the Coast Artillery Corps with a well-founded conception of its past progress and accomplishments. His well-defined ideas for the future will be placed in effect without shock or rupture of the smooth course of advancement which is characteristic of the Coast Artillery today.

The JOURNAL feels obliged to cater to the average reader who prefers the personal note. To gratify this desire it may be said that General Gulick's schedule of official journeys for the near future indicates that he intends to make frequent visits to the various Coast Artillery posts and activities and observe for himself. He has expressed a desire that there be a free expression of opinion by the officers of the Coast Artillery Corps on matters which concern the Coast Artillery Corps. His outstanding aspiration is to increase the prestige of the Coast Artillery—a prestige not to be obtained by unworthy methods but based upon actual achievement. He believes that this may be accomplished by a unity of effort not only by the Regular officers but also by the National Guard and Organized Reserve.

On behalf of the Coast Artillery Corps the COAST ARTILLERY JOURNAL congratulates its new Chief and pledges its continued loyalty and cooperation in the accomplishment of its several missions.

# Comments on the Revision of T. R. 435-55, Coast Artillery Target Practice

*By* THE COAST ARTILLERY BOARD

EDITOR'S NOTE: *In the March number the* COAST ARTILLERY JOURNAL *published Parts I and II of the above article which concerned certain changes in Coast Artillery Target Practice Regulations pertaining to seacoast armament. Parts III and IV, concerning antiaircraft firing, are published below. As in the preceding parts no attempt is made to include all changes which have been made in the Target Practice Regulations. The most important changes occur in Paragraphs 34, 35, 37, and 39. The discussion (Part IV) which has been prepared by the Board is not included in the revised regulations but will make clearer the reasons necessitating such changes as were made. The revised T.R. 435-55 should be issued by the War Department about June 1.*

## PART III

34. *Officials and their duties.* Each Regimental Commander will, in conformity with these regulations, prescribe the character of the practices and the time for holding same. He will, if practicable, be present at all record practices and will act as umpire and decide any points of controversy that may arise, either as to the conduct of a practice, the analysis of same, or the figuring of the score. In cases of unavoidable absence he will appoint a qualified officer to act as umpire for him. He will detail such officials as may be required to insure the proper conduct of all record practices and the keeping and authentication of the necessary records. Prior to the commencement of the practice the Regimental Commander, or officer detailed to act for him, will assure himself that his assistants are well instructed in their duties, and that they are properly equipped to carry out these instructions, to the end that accurate records will be available for the plotting of hits and computation of the score. These officials and the duties performed by each are enumerated below:

*a.* Timekeepers.

(1) x x x

(2) x x x

(3) The assistant timekeepers will keep an accurate record of the time of action of the gun, or machine gun, to which assigned. In case of a gun out of action prior to the command *cease firing,* the assistant timekeeper assigned to that gun will record the time of action and the time out of action, and the circumstances pertaining thereto. This information will be authenticated and given to the timekeeper immediately after the practice. "Time out" will be allowed only when the field of fire is unsafe because:

(a) Target has left safe field.

(b) Obstruction in field.

(c) Any gun pointed at or ahead of plane.

(d) Assistant safety officer cannot see plane and hence cannot clear any particular gun.

Materiel failures, misfires, maladjustments, to sights and dials, will not be considered as allowable "time out." The chief safety officer can, however, stop firing when he considers it unsafe to proceed, but if the cause thereof is determined to be a personnel error, or materiel failure, the time which the guns were not firing will be charged against the battery.

(4) Time of action will begin with the command *commence firing* except when firing is suspended when the field of fire is unsafe as enumerated in subparagraph (3) above, and investigation shows that such suspension was not the fault of the battery personnel or materiel. Time considered on each course will be that of all the guns of the battery independent of the number of guns firing. Any course having a clearance of at least 30 seconds will be considered as a course in computing the score whether or not the battery has fired. For machine guns a course of at least 20 seconds will be counted as a course. If a course is fired on, it will count as a course regardless of the duration of the clearance.

(5) Time of flick. The time from the command *"in action"* until the target is flicked by any of the searchlight beams. If this does not occur within the first five seconds it is not recorded. A "flick" is any illumination of the target of less than five (5) seconds' duration.

(6) Time of pick-up. The time from the command "in action" until the target plane is illuminated. A "pick-up" is a continuous illumination of the target for at least five (5) seconds' duration.

(7) Time of illumination. The total corrected time that the plane is illuminated from the pick-up to the proper bomb-release point.

35. *Guns.*

*a.* x x x

*b.* x x x

*c.* x x x

*d.* x x x

*e.* Number of service practices. The annual ammunition allowances for antiaircraft guns are laid down in Army Regulations. At least 50 per cent of all antiaircraft gun ammunition expended in preliminary service practices will be fired at a towed aerial target. Instructions issued annually by the War Department will give the apportionment of ammunition between preliminary and record practices, and the number of such practices.

*f.* Rate of fire. In the record service practices, state of training and safety precautions permitting, a rate of 15 rounds per gun per minute or better will be maintained for M1918 guns, and 25 rounds per gun per minute for M1917 M-1, and M1917 MII, and M-1, M-2, M-3, and M-4 guns. For 75-mm. guns a rate of 10 rounds per gun per minute or better will be maintained.

*g.* Materiel to be manned. Whenever possible, record service practices of regular antiaircraft gun batteries will be conducted with 4 guns.

*h.* Units firing AA guns as additional assignment. Units of harbor defense artillery, or others who fire antiaircraft gun practices, will fire not less than one preliminary and at least one record service practice. The provisions governing these practices will be the same as for regular antiaircraft units. If two or more record service practices are held, one may be a night practice.

*i.* x x x

*j.* Target courses. In the preliminary firings the targets may be towed for safety purposes on straight courses at a constant altitude and constant speed. For all record service practices the target will make such maneuvers as could be expected from a loaded bomber and as are consistent with safety regulations. The following courses will be flown at least once at some time during record service practices.

(1) 90° angle of approach (crossing).
(2) 45° angle of approach.
(3) 0° angle of approach (coming).

*k.* x x x

*l.* x x x

*m.* x x x

*n.* Score for 3-inch antiaircraft practices. The following score has been adopted as a means by which the relative standing of antiaircraft gun batteries may be determined. It is based on hits per battery per minute, and on percentage of hitting as a function of the slant range, on angular velocity of the target, and on the ability to obtain hits on each course.

(1) For all 3-inch antiaircraft guns with 3-inch antiaircraft shrapnel and Mk III Scovil Fuze. For each course the score is:

$$C_1 = B_h\,(B_D + B_\Sigma) + B_r$$

and the value of each component is:

$$B_h = \frac{10h^{2/3}}{S} = \frac{10h'}{S} \quad \text{(See table for values of } h'\text{)}$$

$$B_D = D^2 + DR$$

$$B_\Sigma = \frac{20t}{D} \times \left(\frac{S_g - 50}{S_g}\right)$$

$$B_r = \frac{30}{N} - \frac{10}{N}\left(\frac{r}{r_1}\right)^2$$

and the total score is

$$\text{Score} = C_1 + C_2 + \text{etc.}$$

Where

$C_1$ = Score for first course.
$C_2$ = Score for second course, etc.
$B_h$ = Hitting component.
$B_D$ = Range component.
$B_\Sigma$ = Angular velocity component.
$B_r$ = Rate of fire component.
$h'$ = Hit value in score.
$h$ = Number of hits.
$S$ = Total number of rounds in *entire practice.* This should never be taken as less than 50 unless the target was shot down after this number of rounds has been fired. See Notes, paragraph *35* n (4).
$d$ = .001 average slant range of course in yards.
$R$ = .001 average horizontal range of course in yards.
$t$ = Average time of flight of course to nearest tenth of second.
$S_g$ = Average ground speed of plane for course to nearest mile per hour.
$N$ = Total number of courses in practice.
$r$ = Normal rate of fire of materiel per gun per minute. This is for 75-mm. guns, 10 rounds; for 3-inch M1918 guns, 15 rounds; for 3-inch M1917 and M1, and other similar mobile guns, 25 rounds; and for 105-mm. guns, 15 rounds.
$r_1$ = Developed rate of fire per gun per minute of course to two decimal places.

(2) *Additional modification for 75-mm. AA guns.*

$$B_D = 2\ (D^2 + DR) \qquad B_\Sigma = \frac{14t}{D}\ \frac{S_g - 50}{S_g}$$

(3) *Additional modifications for 105-mm. AA guns and 3-inch AA Guns M1917 M1 and MII; M-1, M-2, M-3, and M-4 mobile guns with M-2 mechanical fuze.*

$$B_D = .6\ (D^2 + DR)$$

(4) *Notes.* When the target is shot down, these rounds which burst afterwards may be disregarded in computing the score. *No other shots will be disregarded in computing the score.* Attention is called to the provision which requires firing on each course for which a clearance of 30 seconds or more is given. Not less than two or more than four courses will be flown during a record practice. A record practice begins when the Battery Commander reports himself ready. He is then given the opportunity to fire 30 rounds. Should he not fire on four courses for which he has been cleared he will be considered to have completed a record practice and his score will, of course, be zero. He may fire all his ammunition on two successive courses in which case the practice ends. When, however, he has not fired all his ammunition at the end of four courses the practice also ends. Should he allow the target to pass, when cleared by the safety officers as

stated above, his score for that course is zero and he continues until four courses have been flown or unless he has shot all his ammunition. *It is to be noted particularly that the Battery Commander will be given the opportunity for each record practice to fire on not more than four courses.* The value of S used in the score will be taken as not less than 50 unless the target was shot down after more than 50 rounds have been fired, in which case those rounds in the air after the target was shot off may be disregarded. This is the only case in which a value of S less than 50 may be used. The Battery Commander after he has fired on any one course may terminate that course so that he may fire on the remaining courses if he so desires. He may, however, if he so desires, fire as long as the field of fire is safe, provided that he so regulates his ammunition that he can fire on at least two courses. Where he has missed three courses he may fire all possible on the fourth.

(5) The value of the factor h′ may be obtained from the table below:

| *h* | *h′* |
|---|---|
| 1 | 1.00 |
| 2 | 1.59 |
| 3 | 2.08 |
| 4 | 2.52 |
| 5 | 2.92 |
| 6 | 3.30 |
| 7 | 3.66 |
| 8 | 4.00 |
| 9 | 4.33 |
| 10 | 4.64 |
| 11 | 4.95 |
| 12 | 5.24 |
| 13 | 5.53 |
| 14 | 5.81 |
| 15 | 6.08 |

The score will be computed to two decimal places.

For additional values of hits compute h 2/3.

37. *Machine guns.*

*a.* x x x

*b.* x x x

*c.* x x x

*d.* x x x

*e.* x x x

*f.* Materiel to be manned. Each preliminary and record service practice at a towed aerial target will be fired by a platoon of four caliber .50 machine guns. There will be two such platoons organized in each antiaircraft machine gun battery. Where caliber .50 guns are not at hand, caliber .30 guns may be used, but the conduct of fire will be the same for each.

*g.* Conduct of fire. No time out will be allowed for any cause whatever, except for those periods when the safety officer or his assistant stops firing. Guns may be loaded at start of practice. Each service record practice will consist of five courses. The target will be replaced with a new one after each course. Only four guns may be fired. Crews will not be shifted to other guns during any one record practice.

*h.* Targets. The scoring target is taken as a truncated cone 10 feet long, 5 feet wide at the mouth, and 3.5 feet wide at the tail. The standard target is the B-9 or B-9-A. The multiplier for the B-9 or B-9-A target is 0.788 times the number of holes.

*i.* Hits. The target given above as the scoring standard is of such dimensions that the number of hits to be counted would be the number of holes multiplied by two. The standard sleeve, however (B-9 or B-9-A), is of such dimensions that the number of hits shall be the number of holes multiplied by 0.788. Where non-standard targets are used the multiplier will have to be computed. The umpire or his representative will count holes and will deliver this information to the Battery Commander. In case a nonstandard target is used the umpire or his representative will determine the proper multiplier.

*j.* Target courses. For preliminary practices the target may be towed on a straight line at a constant speed and altitude; for record service practices the towing plane will make such maneuvers as are consistent with safety. Efforts will be made to fire at least once during the series of record service practices on each of the following courses:

(1) 90° approach (crossing).
(2) 45° approach.
(3) 0° approach (coming).

The range for each course will be averaged. The range for the practice will be the weighted average slant range of that five course.

*k.* x x x

*l.* x x x

*m.* x x x

*n.* Score for machine guns. The following score has been adopted as a means by which the relative standing of antiaircraft machine gun batteries may be determined. It is based on hits per gun per minute, on percentage of hitting as a function of slant range, on angular velocity of target, and the ability to obtain hits on each course. For each course the score is:

$$C_1 = B_B \ (B_D + B_\Sigma)^{\frac{1}{2}} B_r$$

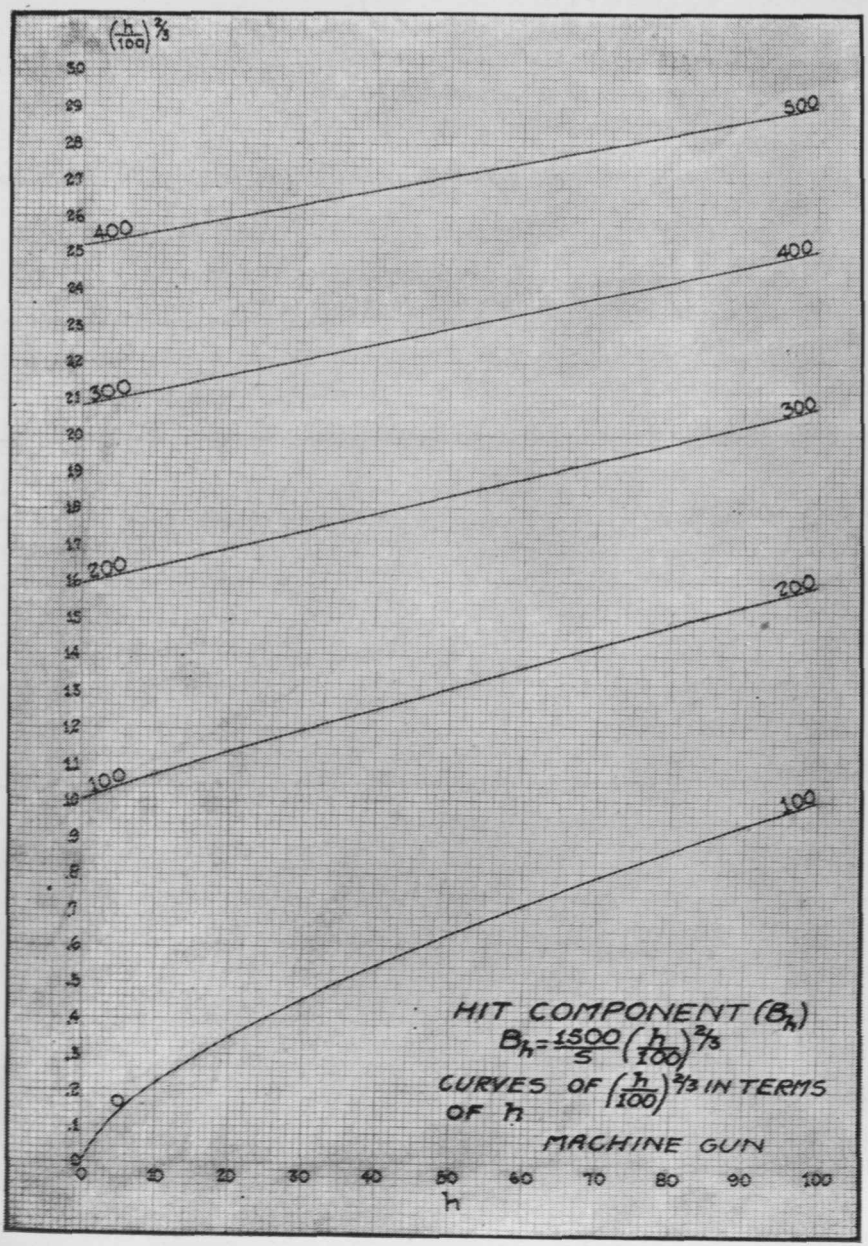
and the value of each component is

$$B_h = \frac{1500}{S}\left(\frac{h}{100}\right)^{2/3} = \frac{1500\ h'}{S} \text{ (See table for value of h')}$$

$$B_D = \frac{D^2 + DR}{3}$$

$$B_\Sigma = 4D\left(\frac{S_g - 50}{S_g}\right)$$

$$B_r = \frac{30}{N} - \frac{10}{N}\left(\frac{500}{r_1}\right)^2$$

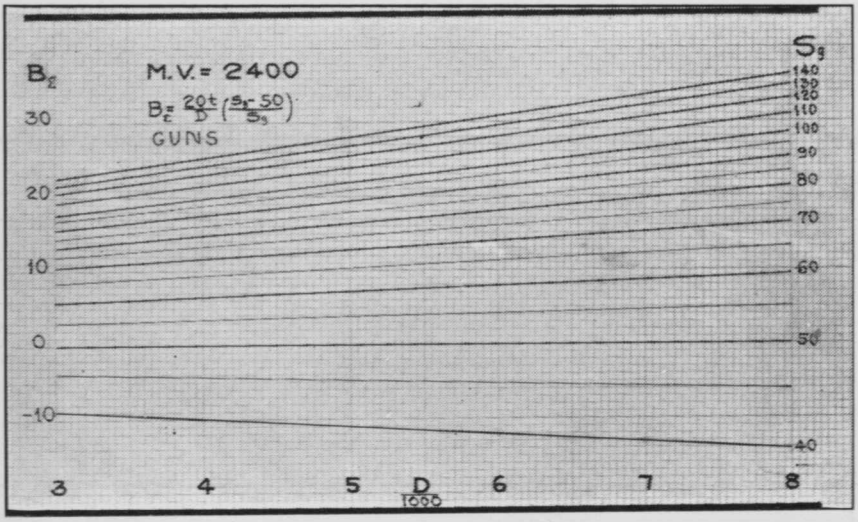


and the total score is:

$$\text{Score} = C_1 + C_2 + C_3 + C_4 + C_5$$

Where

$C_1$ = Score for first course.
$C_2$ = Score for second course, etc.
$B_h$ = Hitting component.
$B_D$ = Range component.
$B_\Sigma$ = Angular velocity component.
$B_r$ = Rate of fire component.
$h$ = Number of hits.
$h'$ = Hit value in score.
$S$ = Total number of rounds in *entire practice*. This will never be taken as less than 2000 rounds.
$D$ = .01 average slant range of course in yards.
$R$ = .01 average horizontal range of course in yards.
$S_g$ = Average ground speed of plane for course to nearest mile per hour.
$N$ = Total number of courses in practice. This is always 5.
$r_1$ = Developed rate of fire of materiel.



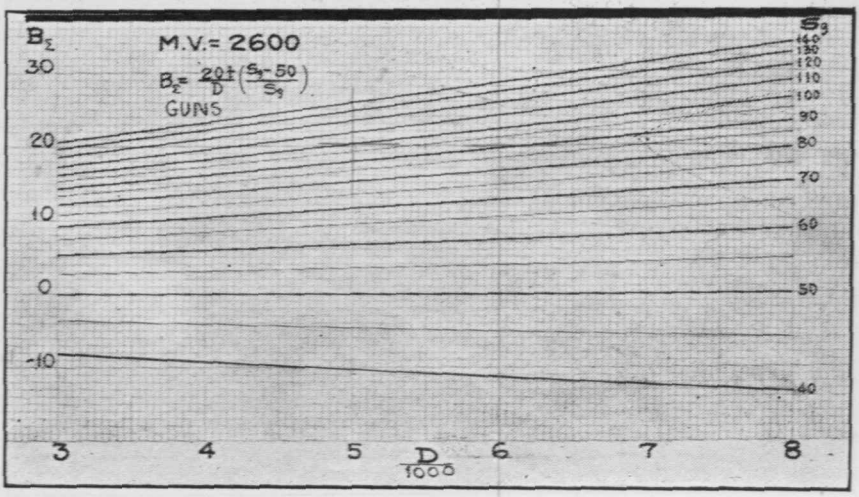

(1) *Notes.* It is to be noted that a machine gun practice will consist of five courses. The Battery Commander may allocate his ammunition as he desires. Normally the safety officer will not clear the field unless 30 seconds of firing time is available; when, however, a clearance for 20 seconds or more has been given the Battery Commander must fire. If he does not do so, the flight will be considered a course and the score for that particular course is zero. When the Battery Commander permits five courses to be flown for which he has been cleared and has not fired, he will be considered to have completed a record practice and his score will be zero. Hence, it can be seen that the Battery Commander has the opportunity to

fire on five courses on each of which he is scored and to each of which he may allocate such part of his ammunition as he desires. No more than five cleared courses will be flown on any record practice.

(2) A practice will begin when the Battery Commander reports his battery ready. Attention is called to the provision which requires that the minimum value of S shall be 2000. Since the practice consists of five courses, the value of N is always 5 and no allowance is made for missed courses.

(3) The score will be computed to two decimal places. The factor H′ may be obtained by interpolation from the table below. When more hits are made than the table shows the value h 2/3 should be computed.

| *h* | *h′* | *h* | *h′* |
|---|---|---|---|
| 5. | .14 | 100. | 1.00 |
| 10. | .22 | 110. | 1.07 |
| 15. | .28 | 120. | 1.13 |
| 20. | .34 | 130. | 1.19 |
| 25. | .40 | 140. | 1.25 |
| 30. | .45 | 150. | 1.31 |
| 35. | .50 | 160. | 1.37 |
| 40. | .54 | 170. | 1.42 |
| 45. | .59 | 180. | 1.48 |
| 50. | .63 | 190. | 1.53 |
| 55. | .67 | 200. | 1.59 |
| 60. | .71 | 300. | 2.08 |
| 65. | .75 | 400. | 2.52 |
| 70. | .79 | 500. | 2.92 |
| 75. | .83 | 600. | 3.30 |
| 80. | .86 | 700. | 3.66 |
| 85. | .90 | 800. | 4.00 |
| 90. | .93 | 900. | 4.33 |
| 95. | .97 | 1000. | 4.64 |



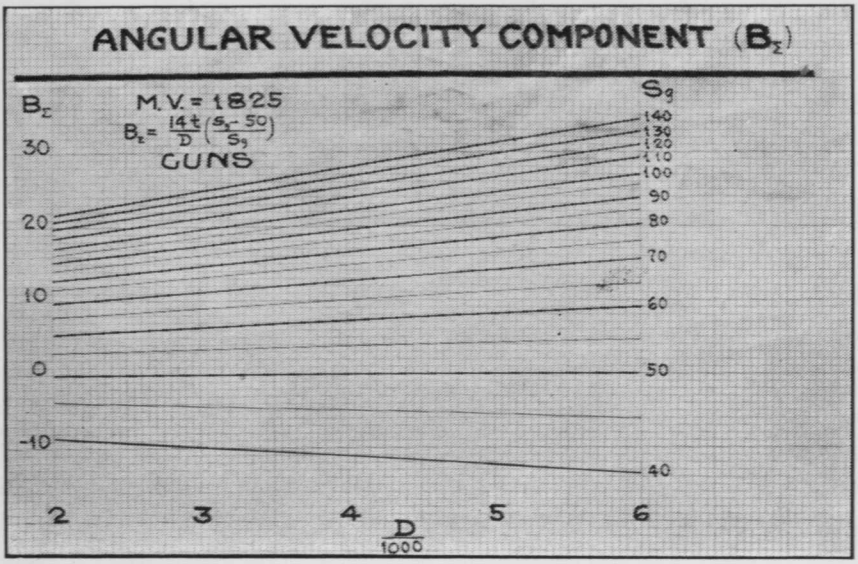
39. *Searchlights.*

*a.* x x x
*b.* x x x
*c.* x x x
*d.* x x x
*e.* x x x
*f.* x x x
*g.* x x x

*h.* Score. The following score has been adopted as a means by which the relative standing of antiaircraft searchlight batteries may be determined. It is based on the time of effective illumination and on the elapsed time from "in action" to "illumination." The score for each course will be valued as follows:

(1) One-half (½) point for each second of time that the plane is illuminated during any part of the two-minute travel time of the plane immediately prior to the proper bomb release point. The time for which the credit is allowed need not be continuous and is computed on the corrected course [see paragraph 39 d (2) (g).] Maximum 60.

(2) One-fourth (¼) point for each second of time that the plane is illuminated during any part of the eighty (80) second travel time of the plane immediately prior to the two (2) minute travel time of the plane described in (1) above. The time for which this credit is allowed need not be continuous and is computed on the corrected course [See paragraph 39 *d* (2) (g).] Maximum 20. (NOTE: One-half (½) or one-quarter (¼) point credits are computed from the time the plane is illuminated. No credit will be given unless a pick-up is made [See paragraph 34 *a* (6).]

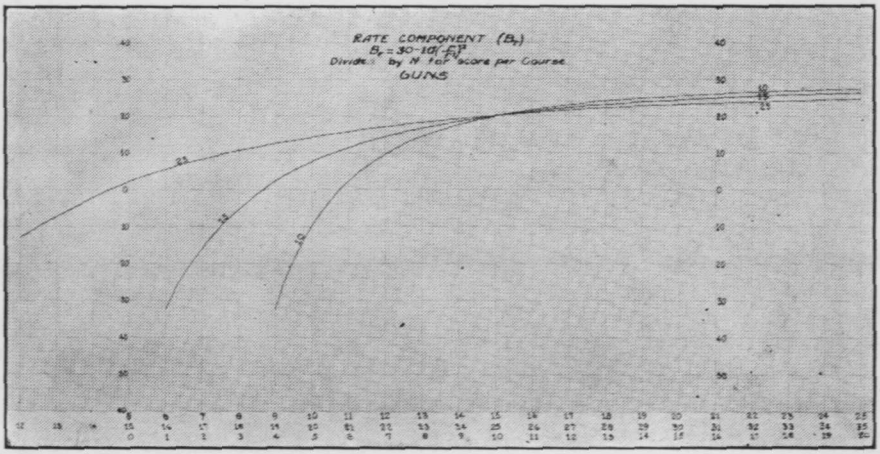


(3) For quick pick-ups the following bonuses are allowed:

| *Points* | : *Time from "In action" to "Illumination"* |
|---|---|
| 20 | : 10 seconds or less |
| 15 | : Over 10 and including 20 seconds. |
| 10 | : Over 20 and including 30 seconds. |
| 5 | : Over 30 and including 45 seconds. |
| 0 | : Over 45 seconds. |

This credit will be allowed for only one pick-up on each course and the plane must be continuously illuminated for at least five seconds.

(4) Ten (10) points for a flick observed by the Regimental Commander, or his representative, at the gun position, or for a pick-up; provided, that the flick or the pick-up occurs within the first five seconds after "in action" and prior to the plane reaching the correct point of bomb release.




(5) For scoring purposes only 8000 feet altitude will be considered as the standard altitude for a bombing plane flying on a bombing mission.

(a) If the target plane is lower than this altitude on any course the score for that course will be multiplied by the following factor:

$$\left[\ 1.4 - .4 \left\{\frac{8000}{\text{Alt. (Ft)}}\right\}^2\ \right]$$

(b) If the altitude of the target plane is above 8000 feet the score for that course will be multiplied by the following factor:

$$\frac{(\text{Altitude of plane in feet})^2}{(8000)^2}$$

(c) Altitude of the target plane will be the altitude of the plane at the instant of illumination.

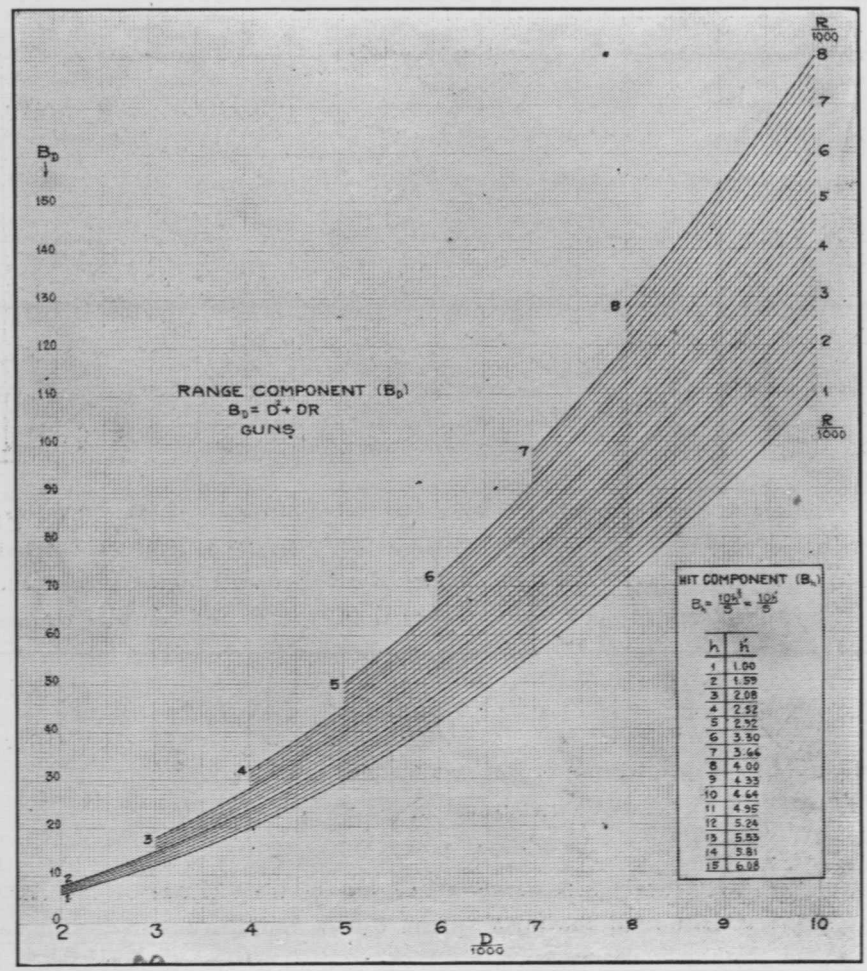
(6) The score for a course will be multiplied by the following factor:

$$\frac{\text{Ground speed of plane (in miles per hour)}}{80}$$

(7) Add the scores of the individual courses and divide the sum by the number of courses in any one exercise to obtain the score for the record exercise. The minimum score for any course is zero.

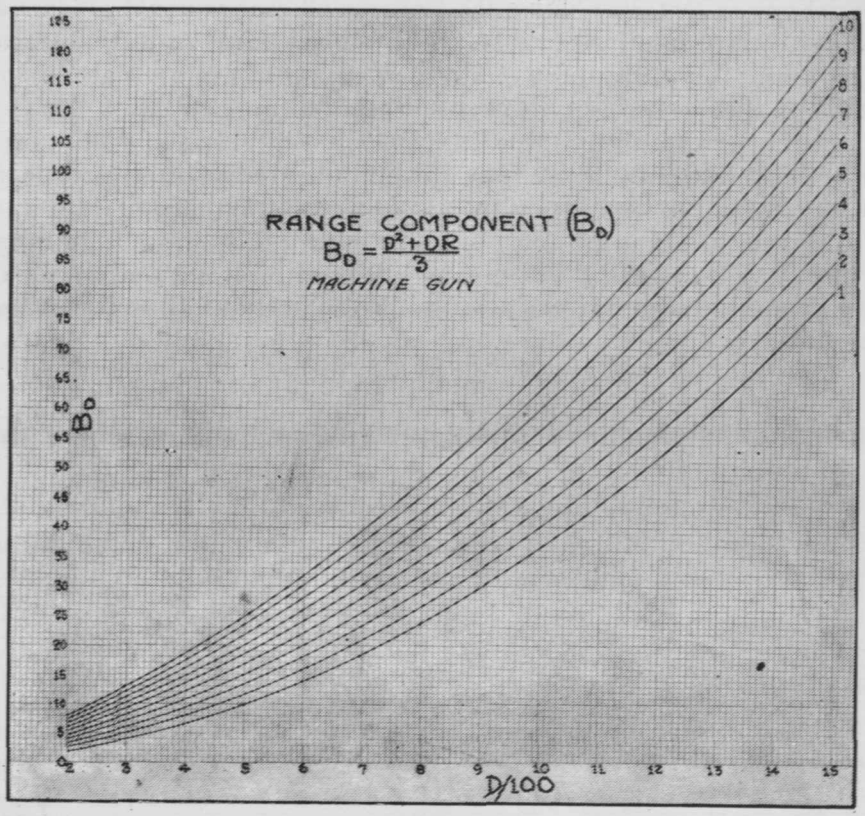
(8) The above score will be multiplied by 1.4 to obtain the final score if an observation plane (such as 0-11) is used as the target plane. If a bombing plane (such as an XB2—Curtis Condor) is used the score will not be multiplied by this factor.

(9) Four courses flown over different parts of the defended area will constitute an exercise.



## Part IV

In prescribing the conditions under which antiaircraft target practices are to be conducted, one principle was adhered to—the practices must be conducted under service conditions. This rule led to two new features in the regulations: (1) no "time out" will be allowed for any materiel or personnel failure whatever; (2) for all record service practices the target will make such maneuvers as could be expected from a loaded bomber and as are consistent with safety regulations. An immediate objection to these




requirements, particularly to the second, is that many antiaircraft batteries are not equipped with the latest fire control apparatus and will therefore suffer in comparison with batteries having better equipment. The consideration that prevailed may be stated as follows: It is true that many antiaircraft batteries will be poorly equipped but the score should measure the condition of the materiel as well as the degree of training of the personnel. Furthermore, it is to be hoped that the materiel situation is only a temporary one. It is possible that for the next few years there may be many low scores in antiaircraft target practices but this is to be expected.

*The Score.* Guns.

The scoring formula for antiaircraft guns is entirely new. The formula is based upon a careful analysis of the several elements affecting gun fire. In the new formula an attempt was made to have the score decrease as the angular height increased and increase with an increase in the number of hits, slant range, time of flight and angular velocity.

The hitting component

$$B_h = \frac{10\ h^{2/3}}{S}$$

was chosen so that distributing the hits over all courses would produce a greater score than a large number of hits on one course and few hits on the others. Thus, two hits on each of four courses will give a higher score than eight hits on one course and none on the others.

As the formula stands, the smaller number of rounds will, other things being equal, secure the larger score. In order to prevent undue advantage on this account the restriction is imposed that S (the number of shots) will never be taken as less than 50, except in the case in which 50 or more rounds have been fired, it is found that the target had been shot down on, e. g., the 45th round. In this case S would be taken as 45 in computing the score.

The slant range component

$$B_D = D^2 + DR$$

includes slant range and angular height. This can be seen by writing the formula as

$$\begin{aligned} B_D &= \frac{D^2}{50}\left(1 + \frac{R}{D}\right)50 \\ &= \frac{D^2}{50}\left(1 + \cos\epsilon\right)50 \\ &= \left(\frac{D}{5}\right)^2 \left(\frac{1 + \cos\epsilon}{2}\right)50 \end{aligned}$$

Thus, the score increases as D increases, and decreases as the angular height increases. Par score for this component is 50. If the slant range is 5000 yards, the angular height would have to be 0° to attain par. Hence for $\epsilon$ greater than 0°, it is necessary to fire at slant ranges greater than 5000 yards in order to get a score equal to par or better.

The angular velocity component

$$B_\Sigma = \frac{20f}{D}\left(\frac{S_g - 50}{S_g}\right)$$

may be written

$$B_\Sigma = 20\left(\frac{1 - \frac{50}{S_g}}{D}\right)$$

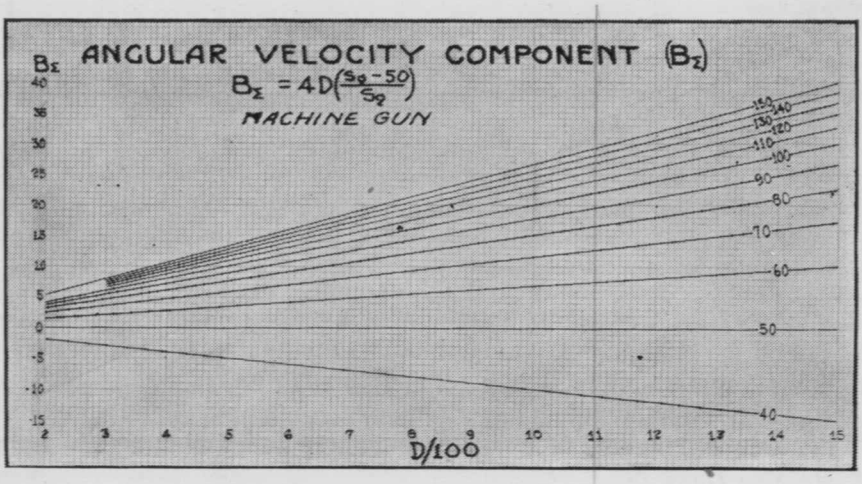
The expression $1 - \frac{50}{S_g}$ increases with $S_g$. The angular velocity varies directly as $S_g$ and inversely as the slant range. Hence $1 - \frac{50}{S_g}$ is a measure of the angular velocity. Hence $B_\Sigma$ increases with angular velocity and time of flight.

The rate, or time component, is

$$B_1 = \frac{30}{N} - \frac{10}{N}\left(\frac{r}{r_1}\right)^2$$

Par score for this component is 20. When the developed rate of fire is equal to the normal rate, i. e., when $r_1 = r$, $B_r = \frac{20}{N}$. For an infinite rate of fire, the score for this component will be 50 per cent above par. That is, for rates of fire greater than normal, the score increases rather slowly; on the other hand, for rates of fire below normal, the score decreases more rapidly and may become negative. In other words, the formula does not give much reward for high rates of fire; for rates of fire much below the normal rate, the formula imposes a substantial penalty.

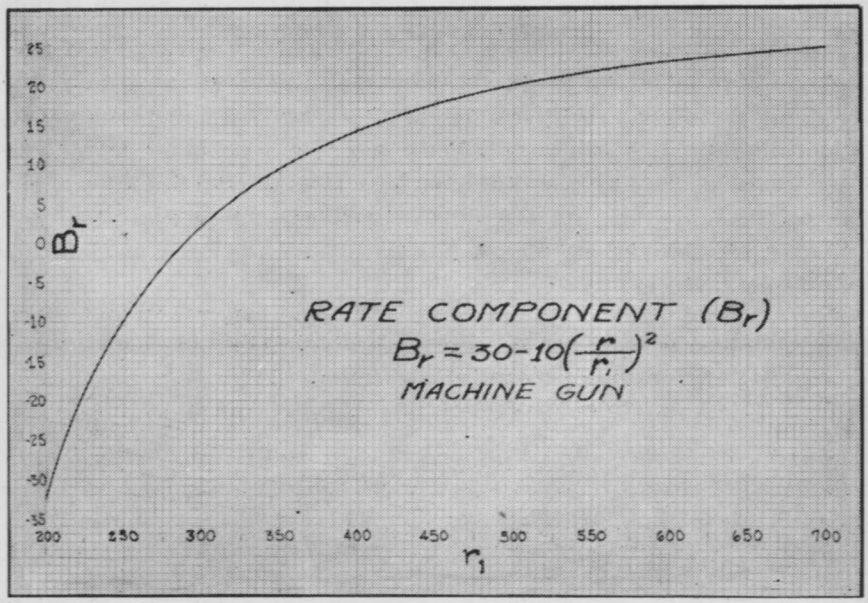
Curves for the various components have been prepared and may be used in computing the score.




*Courses.* Guns.

The new regulations are very specific as to what constitutes a "course." A practice begins when the Battery Commander reports himself ready. After the Battery Commander has reported himself ready, any flight upon which a clearance of 30 seconds or more is given will constitute a course. Also any flight upon which one or more shots have been fired will constitute a course even though less than 30 seconds clearance is given. If no shots are fired on the course, the score for the course is

zero. Each time the target passes the battery will count as a course provided the battery has been cleared for at least 30 seconds or fired upon. After four courses the practice ends. Thus, if the battery fails to fire on the first three courses and fires all its allowance on the fourth course, the score will be zero for three courses. If, however, the battery fires 80 rounds on the first two courses the practice ends. That is, the battery will not be penalized for failing to fire on a course after the allowance of ammunition is exhausted, although, in general, a better score should be obtained by firing on more than two courses. On the other hand, the battery must fire on at least two courses. If the battery should exhaust its entire




allowance on the first course it will score a zero for the second course, but not on the third and fourth courses. This rule may be readily understood when one considers that the intent of the rule is to emphasize the necessity for firing on a plane as soon as it comes within range.

*Machine Guns.*

The foregoing remarks pertaining to the score for antiaircraft guns apply also to the score for antiaircraft machine guns. There are, of course, some differences in formulae and in the restrictions as to courses, but the principles of scoring are the same in both guns and machine guns. A machine gun practice consists of five courses. The target will be dropped after each course.

During the past year, reports of antiaircraft machine gun practices indicate that few Battery Commanders understood the method of comput-

ing the multiplier for non-standard targets. The standard "scoring target" is defined as a truncated cone 10 feet long, 5 feet wide at the mouth and 3.5 feet wide at the tail. This target is of such size that the number of hits must be multiplied by two. The cross sectional or presented area of this target is 42.5 feet. Since each hole in the target is counted, and the count multiplied by two to find the number of hits, it is apparent that the hypothetical target may be taken as a surface of 170 square feet in which each hole is a hit. This surface is assumed to be approximately equal to the vulnerable area of a hostile airplane.

The multiplier for the B-9 or B-9-A target is .788. The regulations require that when a target other than the B-9 or B-9-A is used, the multiplier must be computed. To compute this multiplier the area of the longitudinal cross section of the non-standard target must be computed. The multiplier is inversely proportional to this area. The longitudinal cross section is a trapezoid, and the area is equal to one-half the product of the altitude into the sum of the bases. Thus in the case of the standard scoring target mentioned above, the area in question is

$$\tfrac{1}{2} \times 10 \times (5 + 3.5) \text{ or } 42.5 \text{ square feet}$$

The corresponding area for the B-9 target is 107.8 square feet. If we let x be the multiplier desired, we have

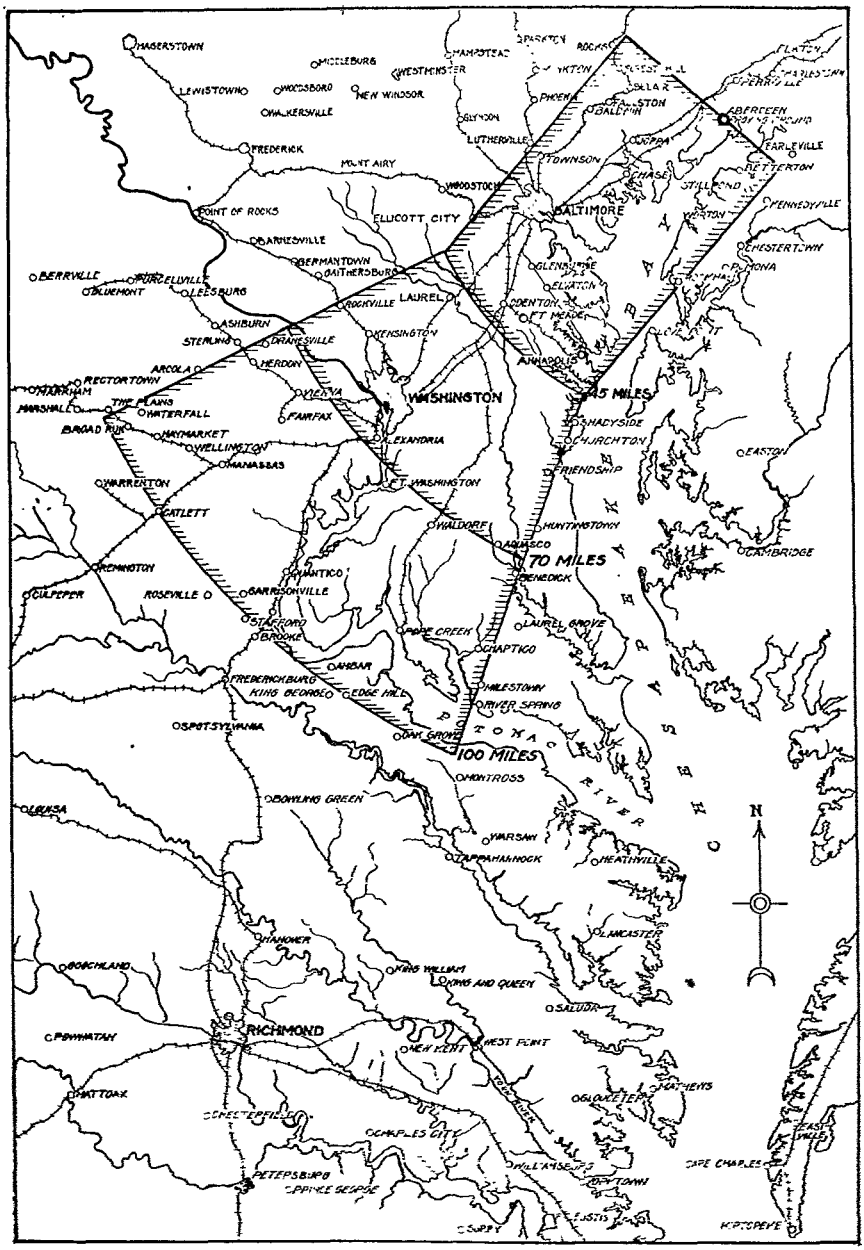
$$x : 2 = 42.5 : 107.8$$

or

$$x = \frac{2 \times 42.5}{107.8}$$

$$= .788$$

which is the multiplier specified for the B-9 target. For any other target, e. g., a B-9 target from which the tail has been shot away, the multiplier is computed in the same way.




SKETCH MAP SHOWING TERRAIN INCLUDED IN ABERDEEN EXERCISES

# Joint Antiaircraft-Air Corps Exercises at Aberdeen Proving Ground

THE Joint Antiaircraft-Air Corps exercises to be held at Aberdeen during the period May 12-17, 1930, are in no sense to be considered a contest between these two arms of the service. The War Department directive for the exercises states that the objective for the exercises will be:

The development of tactics and technique of the joint defense of an airdrome by the Air Corps and Antiaircraft Artillery; to test the soundness of the organization and equipment for the Antiaircraft Brigade Intelligence Battery, Coast Artillery Corps, is shown in the attached table, by organizing a provisional intelligence battery from troops designated to take part in these exercises.

This same directive appointed a board of officers to draw up plans for the exercises. The board consisted of the following members:

Lieut. Col. John M. Dunn, 62nd C. A. (AA)
Maj. George L. Van Deusen, S. C.
Maj. Fred H. Coleman, A. C.

The board met shortly after January 1 and after careful consideration submitted (February 26, 1930) a plan for the exercises.

Aberdeen Proving Ground was selected as the hypothetical airdrome to be defended. The terrain to be covered is clearly indicated in the accompanying sketch map. The board realized that the air defense of any locality must be an all-around defense. However, the necessary ground troops for an all-around defense were not available, necessitating the limiting of the exercises to the peculiarly shaped area inclosed within the heavy lines on the sketch map. The defensive organization, therefore, will be only a part of that which would be necessary under actual service conditions. The sector to which the exercises are limited is approximately forty degrees.

The 62nd Coast Artillery, under command of Lieut. Col. J. M. Dunn, arrived at Aberdeen on April 11 and was available for the exercises. The 69th Coast Artillery, Lieut. Col. J. B. Taylor, commanding, was organized at Aberdeen in February and was likewise available. Both of these regiments will participate in the defense. In addition the 1st Signal Company, Fort Monmouth, was designated to participate. These permanent organizations make up the ground defense forces. From these will be drawn the personnel to form the Provisional Antiaircraft Brigade Intelligence Battery. The personnel of the 69th C. A. (AA) will be used freely in its organization. (Although a provisional table of organization for this battery was mentioned in the directive it is not reproduced in this article due to its very tentative nature and the certainty that it will be greatly changed during the conduct of the exercises.)

The use and disposition of the intelligence battery is one of the most important considerations of the exercises. Observation posts will be established in three belts as shown on the sketch map at distances (from Aberdeen) of forty-five, seventy, and one hundred miles. While there are other observation posts nearer to Aberdeen these will be manned by the antiaircraft regiments. It will be the duty of the personnel of the intelligence battery to report any hostile planes entering the terrain to be covered. To ensure exact information as to the movements of hostile planes within this terrain the board has prescribed that observation posts be established at intervals of five miles, approximately, along the three belts. This interval cannot be maintained exactly due to variations in the terrain such as the Potomac River. It is estimated that the forty-five-mile belt will require six stations; the seventy-mile belt, nine; and the one hundred-mile belt, fourteen.

Each station will be manned by one or two observers. Two observers will be required where communication to the intelligence center is by radio. Radio will be used for communication from posts located on the seventy- and one hundred-mile belts. Not all stations on these belts will be provided with radio. One radio set will serve several stations. Communication will be established between the radio observation post and the other stations served by it, by means of field telephones and telephone wire. About fifteen radio sets will be provided for the radio net. Communication from stations on the forty-five-mile belt and from those nearer Aberdeen will be made by leased commercial telephone lines.

The distances—forty-five, seventy, and one hundred miles—selected by the board for the observation belt are somewhat arbitrary. They may be considered experimental distances selected to determine the proper distances from the defended area at which observation posts should be located in order that the defense forces may be warned of approaching hostile air forces and be given sufficient time in which to meet the hostile attack at sufficient distance from its objective. These distances depend upon several factors. It can be roughly estimated by considering the time consumed in transmitting the warning, alerting and issuing orders to defending air forces, warming of motors, taking off, assuming formation, climbing to the altitude of the hostile planes and covering the distance in order to meet the attack well beyond the limits of the defended area. Having properly estimated the total time needed to place the defending pursuit in position, the distance at which the warning should be given can also be estimated, knowing the probable rate of movement of the hostile attacking force. The distances assumed are tentative and will be more accurately known during the progress of the exercises.

In addition to the personnel of the Provisional Intelligence Battery, the Corps Area Commander and commanding officers of exempted stations will arrange to transmit by radio information concerning hostile planes

entering the sector which may be discovered by observation stations operated by them during the hours when the phases are held. These reports will be made to the central net control station of the exercises. Arrangements will also be made to secure the cooperation of amateur radio stations in the transmission of information concerning hostile planes.

The air forces assigned to the defense will consist of twenty pursuit planes.

The attacking (Red) force will consist of nine attack planes and nine bombardment planes.

The officer in command of the defensive (Blue) organization will be an Air Corps officer who will be assisted by a tactical staff consisting of the following:

Operations officer
Assistant operations officer
Intelligence officer
Assistant intelligence officer
Signal officer
Assistant Signal officer

In order to provide a frame work for conducting the exercises the board prepared a problem extending over the entire period of the exercises and which will be solved in phases. Each phase was so designed as to develop a principle pertaining to the joint air defense of an airdrome.

## THE PROBLEM

MAPS: General Maps. U. S. Geological Survey, one to five hundred thousand. State of Virginia and States of Maryland and Delaware. Geological Survey, one to one hundred and twenty-five thousand. Tolchester, Choptank, St. Mary's, Patapsco, Patuxent, Nomini, Mt. Vernon, Fredericksburg, Harpers Ferry, Warrenton, Spotsylvania, Winchester, Luray, and Gordonsville, Quadrangles.

### GENERAL SITUATION

THE POTOMAC RIVER forms the boundary between two small states—BLUE (north) and RED (south). War has been declared recently and both sides are mobilizing. RED was known, prior to the declaration of war, to have a predominance of air forces.

The ABERDEEN PROVING GROUND, MARYLAND, in BLUE territory, is known by RED to be the location of the nearest important BLUE airdrome and air depot to the frontier.

Upon the outbreak of war RED learned from sympathizers in BLUE territory that heavy consignments of airplane stocks and materials were being shipped into ABERDEEN PROVING GROUND depot and it was definitely determined that among other material received were a considerable number of fuselages and partially assembled planes. RED further learned that immediately prior to the declaration of war certain antiaircraft artillery troops had arrived in the vicinity of ABERDEEN. The

exact number of troops was not learned. Up to and including midnight 10-11 May, 1930 no RED or BLUE airplanes had been observed by either side crossing the frontier.

BLUE GHQ was in possession of the general knowledge that the RED air forces included pursuit, bombardment, and attack planes.

SPECIAL SITUATION (BLUE)—At 11:00 p. m. 11 May, 30, the BLUE Commander of the ABERDEEN PROVING GROUND airdrome and supply depot received the following instructions from BLUE GHQ:

Reliable information has been received that RED air force completed its concentration in the vinicity of RICHMOND late on 11 May, 30. Indications of preparations for early offensive air action have been observed. It is essential that planes and material now being processed by the ABERDEEN depot be supplied and delivered to points covered by previous instructions not later than midnight 17-18 May, 30.

SPECIAL SITUATION (RED)—At 11:00 p. m. 11 May, 30, the RED Air Force Commander received the following instructions from RED GHQ:

Reliable information indicated increased activity at BLUE airdrome and supply depot at ABERDEEN PROVING GROUND, MARYLAND. It is important that utilities and stocks located at that point be destroyed at earliest date. The use of the airdrome, as a base of operations for the BLUE air force should be effectively neutralized until midnight 17-18 May, 30.

### 1st Phase—8:30–11:00 a. m., Monday, 12 May, 30

*Opposing Forces*

Blue—Defense to be fully manned.

Red—Flights of bombardment and attack flying straight courses toward objective in various parts of the sector.

*Objects*

a. To test alertness and functioning of the observation net.
b. To test desirability of observation posts in belts at stated intervals with and without observation posts in between.
c. To determine the proper density of observers as a function of the distance from the defended airdrome.
d. To test the ability of antiaircraft artillery observation posts to receive and transmit to antiaircraft artillery defense alerting warnings of approaching planes.
e. To determine the time hostile planes would be under fire of antiaircraft artillery guns and machine guns.
f. To determine the efficiency of the code system used for transmitting intelligence information.
g. To test the organization and functioning of the airdrome command post, its staff, and intelligence center.
h. To determine time or distance from the target, when or where aircraft should cease attack and antiaircraft artillery begin firing.
i. To determine the best system of evaluating intelligence information furnished by the intelligence battery.

j. To determine what air force agencies or activities should be incorporated in the permanent features of an airdrome in order to render most practicable a joint A. C.-A. A. defense.
k. To determine the best location, relative to each other, of various agencies employed in command functions, receiving, transmitting, evaluating intelligence, etc.
l. To determine the minimum distance from a defended area at which observations can be made and still be of value for interception purposes.

2ND PHASE—1:30–4:00 p. m., Monday, 12 May, 30

| *Opposing Forces* | *Objects* |
|---|---|
| Blue—Same as 1st. | Same as 1st. |
| Red—Same as 1st. | |

3RD PHASE—7:30–10:00 p. m., Monday, 12 May, 30

*Opposing Forces*

Blue—Same as 1st.

Red—Single bombardment planes flying straight courses in various parts of sector.

*Objects*

a. To test alertness and ability of the observation net to function at night in the detection of planes.
b. To test the ability of the antiaircraft artillery to locate and illuminate bombing planes.
c. To develop and test fire control methods in the antiaircraft artillery in the handling of the searchlight platoons and gun batteries, when two, three or more planes simultaneously approach an objective from different avenues of approach.
d. To determine the best method to approach a target in order to make illuminations by searchlight most difficult.
e. To determine the extent to which ground observers can see airplanes at night.
f. To investigate the possibility of planes flying so as to render observation intelligence materially incomplete.

4TH PHASE—8:30–11:00 a. m., Tuesday, 13 May, 30

| *Opposing Forces* | *Objects* |
|---|---|
| Blue—Same as 1st. | Same as 1st. |
| Red—Same as 1st. | |

5TH PHASE—1:30–4:00 p. m., Tuesday, 13 May, 30

| *Opposing Forces* | *Objects* |
|---|---|
| Blue—Same as 1st. | Same as 1st. |
| Red—Same as 1st. | |

6TH PHASE—7:30–10:00 p. m., Tuesday, 13 May, 30

| *Opposing Forces* | *Objects* |
|---|---|
| Blue—Same as 3rd. | Same as 3rd. |
| Red—Same as 3rd. | |

7TH PHASE—8:30–11:00 a. m., Wednesday, 14 May, 30

*Opposing Forces*

Blue—Same as 1st.

Red—Same as 1st, except Red planes to approach objectives flying irregular courses.

*Objects*

To test objectives of preceding where applicable and in addition:

a. To determine the best method of getting intelligence to pursuit already on patrol.
b. To determine altitude at which daylight ground observation is most difficult.
c. To determine altitude at which daylight ground observation is easiest.

8TH PHASE—1:30–4:00 p. m., Wednesday, 14 May, 30

| *Opposing Forces* | *Objects* |
|---|---|
| Blue—Same as 1st. | Same as in preceding. |
| Red—Same as 7th. | |

9TH PHASE—7:30–1:00 p. m., Wednesday, 14 May, 30

*Opposing Forces*

Blue—Same as 1st.

Red—Same as 3rd, except attacking planes to approach objective flying irregular course.

*Objects*

Same as in preceding.

10TH PHASE—8:30–11:00 a. m., Thursday, 15 May, 30

| *Opposing Forces* | *Objects* |
|---|---|
| Blue—Same as 1st. | Same as in preceding. |
| Red—Same as 7th. | |

11TH PHASE—1:30–4:00 p. m., Thursday, 15 May, 30

| *Opposing Forces* | *Objects* |
|---|---|
| Blue—Same as 7th. | Same as preceding. |
| Red—Same as 7th. | |

12TH PHASE—7:30–10:00 p. m., Thursday, 15 May, 30

*Opposing Forces*

Blue—Same as 3rd.

Red—Same as 3rd, except attacking planes to approach objectives flying irregular courses.

*Objects*

Same as preceding.

13TH PHASE—8:30–11:00 a. m., Friday, 16 May, 30

*Opposing Forces*

Blue—Same as 1st.

Red—Attacking force to launch a coordinated air attack against defended area.

*Objects*

Same as 7th with the following additional:

To test system of local observation posts for alerting machine gun batteries of antiaircraft artillery defense upon the approach of attack planes.

14TH PHASE—1:30–4:00 p. m., Friday, 16 May, 30

| *Opposing Forces* | *Objects* |
|---|---|
| Blue—Same as 13th. | Same as 13th. |
| Red—Same as 13th. | |

15TH PHASE—7:30–10:00 p. m., Friday, 10 May, 30

*Opposing Forces*

Blue—Same as 1st.

Red—Attacking forces to launch night bombing attacks of single planes simultaneously at varying altitudes.

*Objects*

To test preceding objectives where applicable and the following additional:

a. To determine and test a system for the use of fire units of machine gun batteries of antiaircraft artillery against night operations of attack planes.

16TH PHASE—8:30–11:00 a. m., Saturday, 17 May, 30

| *Opposing Forces* | *Objects* |
|---|---|
| Blue—Same as 13th. | Same as 13th. |
| Red—Same as 13th. | |

17TH PHASE—1:30–4:00 p. m., Saturday, 17 May, 30

| *Opposing Forces* | *Objects* |
|---|---|
| Blue—Same as 13th. | Same as 13th. |
| Red—Same as 13th. | |

Perhaps some zealous Coast Artilleryman may wish to argue with the placing of an Air Corps officer in command of the defense. The board considered this to be a natural condition where the defended locality happened to be an airdrome which is the case under the assumptions of the problem. To insure better coordination the board prescribed that for the defense the Air Corps officer commanding will direct the disposition of the air forces, the officer commanding the 62nd Coast Artillery will direct the disposition of the antiaircraft artillery, and the board will decide the disposition of the Provisional Antiaircraft Intelligence Battery.

So far as simulated combat is concerned there will be little permitted. It is desired to emphasize the fact that the exercises are for the principal purpose of perfecting intelligence agencies. Therefore, there will be no blank ammunition fired, no smoke screens laid, nor will there be any simulated air combats except by special authorization of the board.

The personnel (and materiel to some extent) will be placed in the correct tactical locations and all operations carried out with the exception of actual or simulated firing. Emphasis will be placed on communications and command post operation.

In air defense exercises time is of the greatest importance. For this reason it will be necessary to pay particular attention to the synchronization of watches. Journals will be kept at all posts and stations in which

all incidents pertaining to the exercises will be recorded. The keeping of journals, diaries, or message books is one of the bugbears of our joint Seacoast-Navy exercises. However, there appears to be no other equally effective method of reconstructing events taking place during such exercises. No doubt the board will impress on all participating the importance of conducting the exercises as nearly under service conditions as possible in order that such recording as will be necessary will not impede the rapidity of action desired.

In the area selected commercial flying is very common. For this reason the board has seen fit to prescribe (for daylight phases) that the Red forces will move in flights of not less than three planes each in order that they may be identified by the defense observers. In prescribing flight formations for the Red forces the board has called attention to one of the principal difficulties of antiaircraft observation. To distinguish hostile planes from friendly planes a very great familiarity and knowledge of planes of all types are required. The exercises should add to the knowledge on the subject of identification of aircraft and will offer a means of determining the accuracy which may be expected from the average observer.

The great amount of energy which the board expended in preparation for these exercises is not apparent from the reading of this article. A great deal of equipment will be required in addition to that already in the hands of the organizations participating. Radio sets, field wire, outpost wire from the Signal Corps; field glasses, compasses, and watches from the Ordnance Department; maps from the Engineers; stationery and office supplies from the Quartermaster Corps: are all very necessary for the operation of the net. Additional funds were estimated and requested for the leasing of commercial telephone lines. More funds were needed for commutation of quarters and rations for the observers in the outer belts who necessarily will have no opportunity to ration at a regular mess. Funds were also required to bring planes from Fort Crockett, Selfridge Field, and Langley Field. The amounts required were small in comparison to the value of the exercises but required the board's careful consideration in each instance.

The joint exercises at Aberdeen are by far more elaborate and carefully planned than any previously held in this country. During the past few years the British have devoted much attention to air defense exercises and have made considerable progress. The exercises at Aberdeen should remove the criticism, sometimes heard, that this country is lagging behind in the development of air defense tactics. They should have much of interest for visiting officers of all components. The convenient location of Aberdeen Proving Ground favors the attendance of a considerable number of military visitors who will be amply repaid by the first-hand knowledge gained.

The visitor, attending with the idea of viewing something spectacular, will probably be disappointed. The board has taken every precaution to avoid the appearance of a contest—an idea which is always uppermost in the popular mind. Air defense exercises are very apt to give a false impression to the casual and unprofessional observer. Even if combats were authorized it would be very difficult to determine the outcomes. It is even more difficult than in joint exercises with the Navy because the rulings and decisions of umpires can not become effective until the completion of a phase. Air formations ruled out many miles from their objectives might proceed merrily on their way and be unaware that they were out of it until after the return to their landing field.

It will be difficult for the visitor to obtain a complete perspective of the operations in the sector due to the extent of the terrain. Although there will be many locations where interesting events are taking place it is very probable that the central command post of the defending forces will be the most popular place for the visitor. Here he may see the nerve center of the system operate and may visualize what is taking place all over the area. Those who are able to do so should take advantage of an opportunity which has been infrequent in the past but will be more common in the future.

*19TH ORDNANCE COMPANY TRANSFERRED TO ABERDEEN PROVING GROUND*

*The Secretary of War has directed the immediate transfer of the 19th Ordnance Company from Watertown Arsenal, Watervliet, New York, to Aberdeen Proving Ground, Maryland, for station. This company will be used at the Proving Ground to restore and to care for railway and other material at that post.*

# Mechanized Machine Guns

*By* Maj. G. M. Barnes, Ord. Dept.

MILITARY authorities are very much concerned as to how it will be possible to protect moving troops from low-flying aircraft in future wars. Practical tests have clearly demonstrated that low-flying aircraft carrying fragmentation bombs and machine guns can cause great destruction by swooping down upon organizations marching along roads. A long column of marching troops makes an almost ideal target for the airplane if the latter can fire from a low altitude directly overhead, spraying machine gun bullets and dropping bombs as it flies at a great speed along the road.

At the present time the only possible defense is for the men to scatter into the fields off the road, firing at the airplanes with shoulder rifles and using machine guns mounted on tripods placed on trucks or on brackets attached to artillery limbers and on other improvised mountings. The machine guns carried in airplanes have no fire-control instruments and are aimed only by pointing, as one would direct a stream of water upon a target; but very crude aiming can accomplish results, since the target presented to the aviator is a long band laid directly below him.

On the other hand, the airplane presents a very elusive target to the machine gunners on the ground, who are also attempting to aim their guns by pointing them at the airplanes as free guns, i. e., without elevating and traversing mechanisms. The ground machine gunner must hit a very small target traveling at a high rate of speed. He has the advantage that his gun and mount are on solid ground, and he can aim with greater precision than the machine gunner in the airplane. But the difference in the sizes of the targets, i. e., the marching column as compared to the airplane, throws the balance decidedly in the favor of the latter.

At the present time the only methods of controlling the fire of these ground machine guns is by using various types of ring sights, or by adjusting the fire, using tracer ammunition, or both. The protection furnished by these ground machine guns is of such questionable value that it is doubtful whether troops can march in the presence of hostile aircraft. Probably most movements along roads will have to be carried out under cover of darkness.

It was in the hopes of providing a suitable weapon to meet this situation that the automatic machine gun mechanism, which will be briefly described, was designed and built. In general, it was desired to produce a highly mobile unit which would form a complete battery having all the refinements of fire control necessary for delivering a great volume of machine gun fire upon any airplanes which might approach. Instead of approximately pointing the machine guns at the on-coming airplanes, it

was desired to accurately train these guns upon the target, using telescopic sights and accurately cut gearing so that angles of at least one artillery mil could be measured and set off. More than this, it was desired that an accurate antiaircraft director, together with the latest type of stereoscopic range and height finder, be mounted on the same platform as the guns and interconnected with them and each other, so that the guns could be caused automatically to lead the target in azimuth and angular height by amounts mathematically correct for the conditons of fire. Thus the machine guns could quickly bring an accurate and destructive fire upon on-coming airplanes. Naturally, the question immediately arises as to how it would be

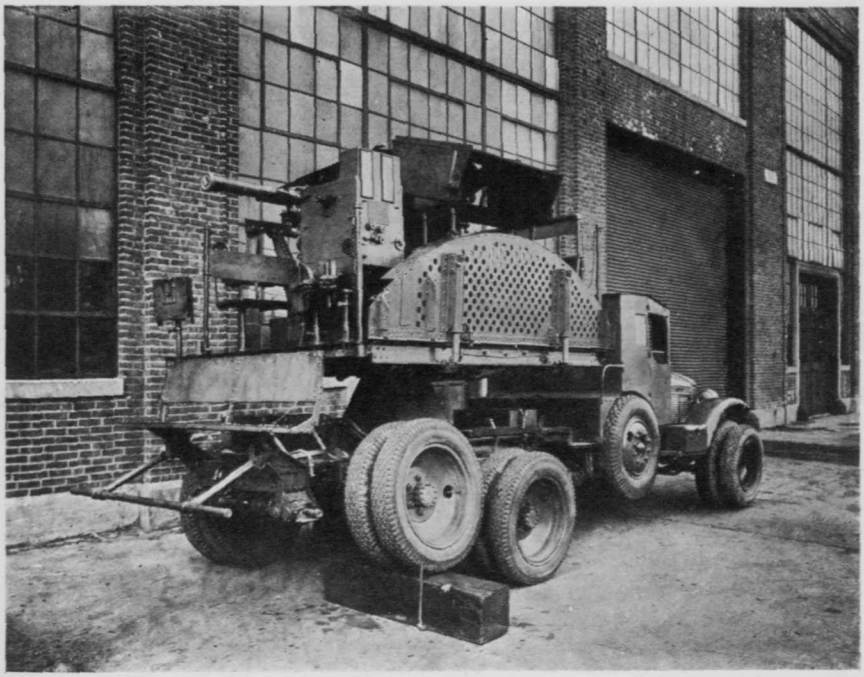


FIGURE 1

possible to fight off a number of planes by such a weapon, having in mind only one unit. Of course, there must be many of these weapons. Why not approximately as many as there are airplanes?

With this very general picture in mind let us examine this new weapon in somewhat more detail, starting with truck upon which the unit has been mounted.

*Description of the Chassis.* Most officers from personal experiences are familiar with the great improvements in pleasure automobiles since the war. Think back to the days of 1917 and remember the many difficulties of keeping the automobile of those days in running order. Now, few people spend any time tinkering with their machines, which run month after month with very little attention. Corresponding improvements have

been made in trucks which now carry heavy loads of freight regularly between cities separated by great distances.

A modern six-wheel truck was selected for mounting the machine gun unit. The six-wheeler, due to the fact that the load is distributed over three axles instead of two, is capable of crossing terrain which the four-wheel truck would be unable to negotiate. In the well-designed, six-wheel truck the two rear axles are driven, and the mechanical arrangement is such that any one wheel may leave the ground about one foot without lifting the other wheels off the ground. This characteristic is especially important when the truck chassis is used as a support for a gun platform.

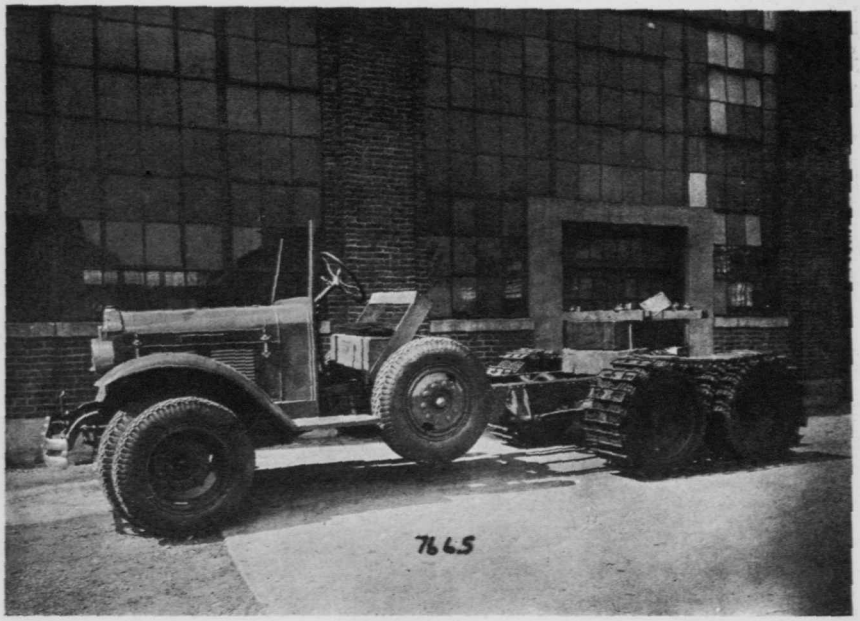



FIGURE 3

With the six-wheel unit, if one wheel drops into a rut in the road the firing platform will not be materially affected. (See Figure 1 showing truck wheel being run over a ten-inch block and note how little the firing platform is thrown out of level.) In order to give increased flotation to the truck on soft ground, dual pneumatc tires are used on the two rear axles and also on the front axle. The outside wheels and tires on the front axle are of smaller diameter, so that these tires will not come into play unless the wheels penetrate into the soft ground. By using dual pneumatic tires on all axles the ground pressures under the front tires for a six-inch penetration is five and three-tenths pounds per square inch and five and one-tenth pounds per square inch at the rear wheels under the same conditions. This low ground pressure, which is about the same as the ground pressure for the Ford cross-country car, insures cross-country mobility.

Furthermore, the six-wheel type of truck permits the use of a light steel track between the wheels of the two rear axles, which can be quickly put in place when soft ground or snow is to be negotiated; thus converting the unit into a half-track vehicle. (See Figure 3.) A light steel track has been developed at Watertown Arsenal for the six-wheel vehicle, which can be put in place in about five minutes. Tests indicate that this track will have a reasonable life if used only on soft terrain which the vehicle could not otherwise cross. These tracks weigh two hundred pounds each, and are carried on the truck ready for use when required.

Another feature is the method of carrying the two spare wheels and tires for the front inside wheels. These spares are mounted on an axle bolted to the truck frame at a point over the gear box of the truck, or the point of minimum road clearance. When crossing rough country this spare wheel comes into play, lifting the front wheels off the ground. When leaving the road or passing over rough ground, it is surprising how often these wheels are brought into play. Placing this axle in this position in effect shortens the wheel base of the truck from one hundred and seventy-six inches to one hundred and one inches. The general characteristics of the truck which weighs nine thousand eight hundred pounds without cab or pay load, and which has a speed of about forty miles per hour on the level are as follows:

Engine: 6 cylinder, 93.5 h. p., Hercules 4¾″ bore x 4¾″ stroke.
Transmission: 7-speed type.
Brakes: 4-wheel hydraulic with vacuum booster.
Rear end, Timken Detroit (6-wheel type): 4-wheel drive.
Gasoline capacity: 50 gallons.
Wheel base: 176 inches.

Tires—
Rear 36 x 6, dump type, pneumatic duals.
Front, inner—36 x 8, pneumatic.
Front, outer—32 x 6, pneumatic.
All tires have non-puncturable inner tubes.

The cab, fenders and hood are constructed of duralumin plates. Comfortable seats are provided for a crew of sixteen men as follows:

2 men in cab.
4 men on seat directly in rear of cab facing rearward.
4 men on folding seat on firing platform facing forward.
2 men on seat on firing platform near director facing forward.
4 men on seat in rear of mount facing rearward.

*Machine Gun Mount.* The base of the machine gun mount is bolted to the truck frame at a point selected to give the best weight distribution on the truck axles. The firing platform, which carries four caliber .50 machine guns, all the necessary firing control instruments and operating personnel, is rotatively attached to the base. All parts of the machine gun mount.

except the machine guns, machine gun cradle, armor plate, and gearing, and a few other parts, are made of heat-treated aluminum alloy. This unit would not be practical if made of steel on account of the weight. By using strong aluminum alloys, the weight of the entire structure placed on the truck chassis, including the weight of the cab, is but five thousand seven hundred and fifty pounds. From the accompanying pictures it would appear that the unit was somewhat top heavy. As a matter of fact, due to the use of aluminum alloy, the vertical center of gravity of the unit is only about ten inches above the top of the truck frame. This insures great lateral stability and the unit is capable of negotiating side slopes as steep as thirty-five degrees. On account of the low center of gravity the

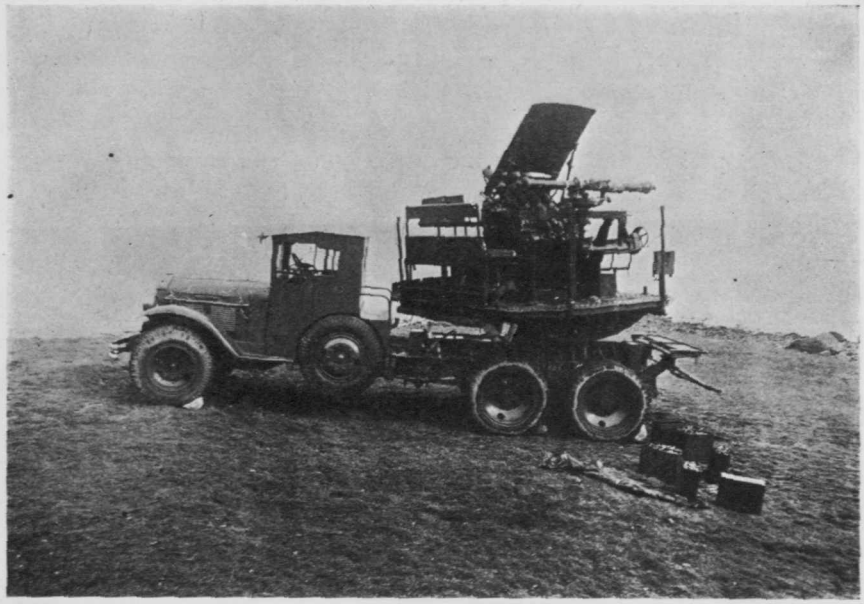


FIGURE 2

truck is as stable on sharp curves at high speed as the ordinary pleasure automobile.

*Leveling Mechanism.* A leveling mechanism is built into the mount base, so designed that the firing platform can be cross-leveled plus or minus ten degrees. (Figure 2.) Suitable shafting and gearing are provided so that the platform can be cross-leveled by an operator seated in the cab opposite the driver. He has before him a gear case supported on a bracket attached to the truck floor, having two handwheels and a small vertical shaft carrying two level vials at its upper end. This vertical shaft is geared so as to always remain parallel to the vertical axis of the machine gun mount. The leveler operates these two handwheels until the level vials indicate that the mount is level. Keeping the firing platform level insures easy traversing of the mount when the latter is on steep grades.

It is also necessary that the height finder, which is carried on the firing platform, be level in order to accurately measure the height of the target. (See Figure 4 which shows the mount in the firing position on the side of a hill.)

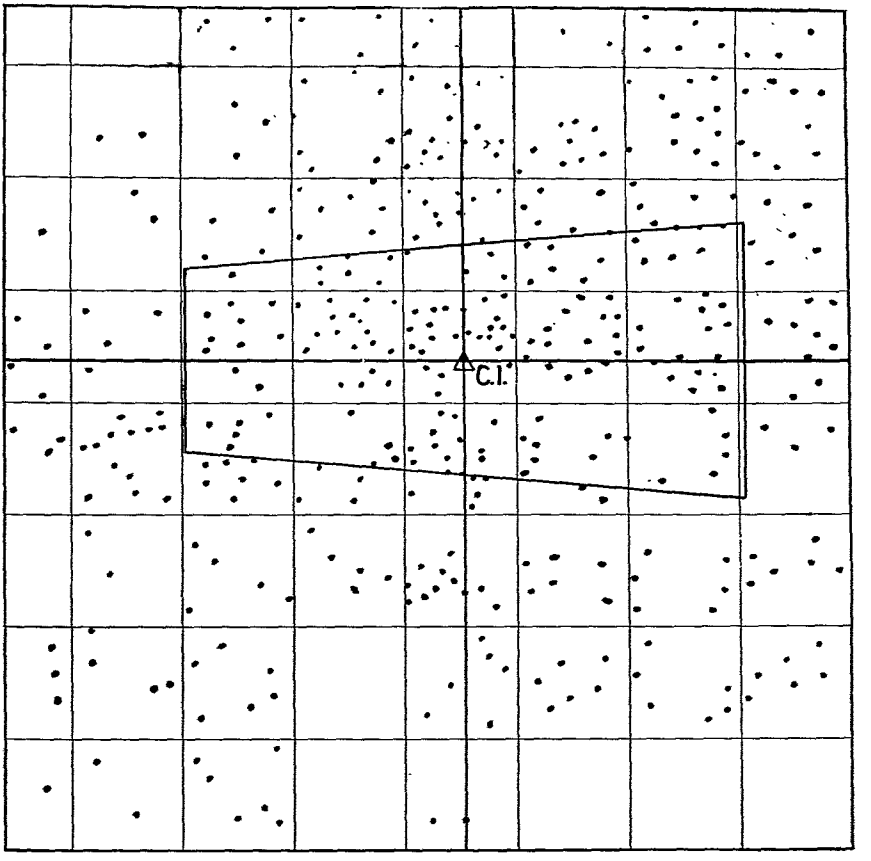



FIG. 6

DISPERSION TEST-3-CAL.,.50 MACHINE GUNS ON MULTIPLE MOUNT.
TARGET 15FT.,HIGH × 15FT.-4IN.,LONG. RANGE 1000 YARDS.
SHOTS FIRED: 500 BALL; 100 TRACER= 600 TOTAL.
HITS ON PANEL TARGET 414=69%.
HITS ON SLEEVE TARGET 5'×10'×3½'; 142 = 24%.

*Machine Guns.* Four (4) caliber .50 machine guns are mounted in a cradle so that all the guns elevate together. Each gun can, however, be independently adjusted in azimuth or elevation. These adjustments are best made by firing at a large panel target placed at a range of one thousand yards and then adjusting each gun separately so that the four guns will distribute the bullets uniformly over the panel target. The number of bullets per square foot of panel can thus be regulated to any desired

amount. (Figure 6 shows such a target, which has been fired upon by four caliber .50 guns at a range of one thousand yards.) The guns are trained in azimuth by means of a geared mechanism, which traverses the guns and the entire platform, and are elevated by a similar mechanism.

*Ammunition Feed.* The ammunition belts are placed in long bins located on the firing platform under and in front of the guns. (Figure 2.) Each bin holds six hundred rounds in belt form. Additional belts can be added as the firing proceeds, thus making continuous fire practical. As far as is known to the writer, this unit is the first continuous fire weapon in existence.

As the gun feed mechanism could not raise this ammunition up to the gun breech at different angles of elevation, it is necessary to have an auxiliary feeding mechanism for this purpose. This mechanism has been so designed that the force of recoil of the gun is utilized to raise the ammunition to each gun as it fires. A hand-operated mechanism is added to assist the automatic lifting device and to feed the ammunition in case the recoil operated device should fail. Ammunition belts in the bins are carried in light aluminum boxes, two hundred rounds per box. The box is so arranged that it can be dropped into the bin, the bottom released, and the ammunition left in the bin in an orderly arrangement, when the box is removed. The ammunition rests on the bottom of the box, which in turn is supported on rollers at the bottom of the ammunition bin. The bottom of the bin is slightly inclined so that the ammunition belts will move towards the guns as the belt plays out of the bin when the gun is fired. When a new belt of ammunition is added, it is connected to the end of the belt already in the bin. Provisions are made for carrying a total of five thousand rounds on the truck.

*Cooling System.* As the four guns can continuously deliver six hundred rounds per minute each of fire, an adequate cooling system is necessary. For this purpose, a twenty-gallon aluminum water tank is placed under the firing platform in a position to counter-balance the weight of the director, which will be described later. This tank is connected with piping which leads through a flexible joint at the cradle trunnions to each of the four guns. (Figure 2.) A hand-driven centrifugal pump having a capacity of two hundred gallons per minute circulates the water. For a burst of two hundred to three hundred rounds per gun, it is unnecessary to operate the hand pump while the guns are firing.

*Cradle Shield.* A small shield of armor plate is mounted on the gun cradle. (Figure 4.) This shield furnishes some protection from enemy machine gun bullets for the operating personnel, but is also an excellent blast shield so that the height finder observer directly in rear of the guns is scarcely aware when the guns are fired. This shield, when traveling, folds down and forms a cover for the protection of the machine guns and ammunition feed mechanism from the weather.

*Firing Mechanism.* All four guns can be fired by a foot pedal operated by the stereoscopic observer in rear of the guns. A small hydraulic pump to which the foot pedal is attached, is connected by flexible tubing to four small hydraulic cylinders mounted on the machine guns. When the operator steps on the foot pedal of the hydraulic pump, the four pistons of the cylinders move out against the triggers of the machine guns. The guns fire until the pressure on the foot pedal is removed. Any one gun can be thrown out of action by tipping the hydraulic cylinder for that gun out of line with the trigger.

*Ammunition Disposal.* One of the difficult problems encountered in the design of this weapon was to obtain a satisfactory method for taking care of the empty cartridge cases and clips. With the four guns firing at a rate of two thousand four hundred rounds per minute, the empty cases and clips occupy a great deal of space unless disposed of as fired. In previous designs these empties have been allowed to fly around, getting into the elevating and traversing gearing of the mount, and sometimes stopping or interfering with their operation. In this new unit the empty cartridge cases are caused to drop into shoots and led off the mount by means of gravity feeds. The clips are similarly caused to move in line in curved shoots and eventually also led off the mount. Thus the guns are automatically kept clear of empty cartridge cases and clips.

*Fire Control Apparatus.* This weapon has been designed on the basis that the most accurate fire control instruments available must be used to control the fire of machine guns when firing at airplanes. For this type of fire there can be no compromise with accuracy. It is futile and a waste of ammunition to shoot at airplanes moving at high speed through space unless the guns are controlled by fire control instruments capable of directing the guns with sufficient accuracy to keep the airplane target within the pattern of the four machine guns. (See pattern made by three machine guns at one thousand yards, Figure 6.) An unusual arrangement has been employed in order to permit of the mounting of these fire control instruments, i. e., the director and the 3-meter range and height finder, on the firing platform.

*The Director.* An antiaircraft director is mounted on a bracket, bolted to the side frame of the gun mount so that it also moves in azimuth as the mount is traversed. (Figure 2.) When the mount traversing handwheel is turned, present azimuth is set into the director by means of gearing and shafting. Similarly, when the gun elevating handwheel is turned, the present angular height of the target is set into the director. Two operators are required to set data into the machine. One operator follows the proper height reading, thus setting time of flight. The second operator follows the height curve and sets super-elevation into the director. Two rate setters are required. By matching rates in the vertical and horizontal planes, these operators generate lateral and vertical deflections. The lateral

deflection is added to the mount traversing gearing system by means of a differential. The height finder is at the same time turned in a horizontal plane on its base by means of gearing and shafting, in an opposite direction by an amount equal to the lateral deflection. Thus the observer at the height finder is not disturbed or thrown off the target when the lateral deflection is thrown into the system. The vertical deflection plus superelevation are added to the elevating gearing system of the guns by means of a differential, resulting in lowering or raising the muzzle of the gun by the amount of this deflection. The director thus furnishes, automatically, mechanically computed vertical and lateral deflections for the altitude,

FIGURE 4

range, angle of approach and ground speed of the target. A wind correction device is included so that corrections are automatically made within the director for the direction and velocity of the wind. Wind azimuth is taken with reference to the longitudinal axis of the truck.

*The Height Finder.* A 3-meter stereoscopic range and height finder having the optical type of conversion mechanism has been mounted directly in rear of the four guns on a special base which is bolted to brackets extending rearward from the side frames of the gun mount. (Figure 4.) A three-power right angle telescope is mounted at the left end of this height finder. An observer, sitting on a folding seat facing the end of the height finder, observes the target, and turns the traversing handwheel to keep this telescope trained upon the target. The entire firing platform is thus moved in azimuth, carrying the guns, the height finder and the director. Similarly, there is a second right angle telescope at the right hand

end of the height finder. The gearing is so arranged that when this operator turns his handwheel and follows the target in angular height, the guns and the height finder elevate or depress in unison. At the same time all movements of the firing platform in azimuth, and of the guns and height finder in angular height, are transmitted to the director by means of gearing and shafting as previously explained. The stereoscopic observer at the height finder keeps his instrument set by turning the range or height dial, and the reader standing beside him telephones these readings to the operators at the director, setting altitude into that instrument. If firing at a

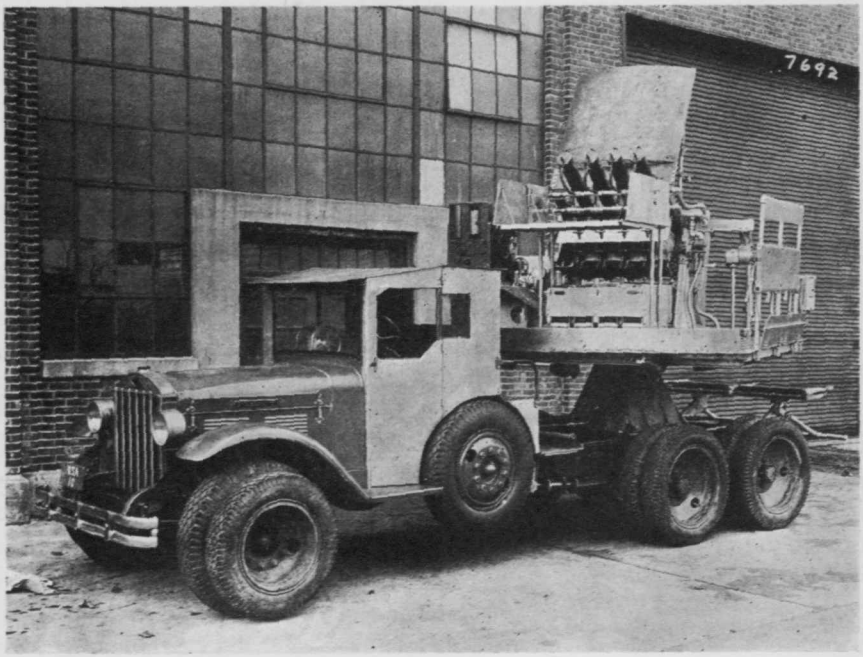



FIGURE 5

ground target he throws a lever on the height finder and reads the range of the target. This range is, in this case, set off at the director as will be explained later. As the height reader and altitude setters at the director are separated by not more than eight feet, a throat type of transmitter is used for this purpose. The time of flight and superelevation setters at the director should wear close-fitting helmets so that they can hear the altitude called, while the guns fire.

*Adjustment of Fire by Observation.* This type of machine gun mount with built-in fire control system is unique in the arrangement for making adjustments when firing. Corrections based on the observation of tracer fire from the guns or by using field glasses are too much in error to be of value. The writer has witnessed many firings with machine guns at targets

towed by airplanes in which the guns were directed upon the target by observing the paths of the tracer bullets. These firings usually appear successful, but when the holes in the sleeve targets are counted, the results are disappointing. It is impossible to aim machine guns accurately in this manner because the gunners see the tracers at an unknown point along the trajectory and can, therefore, not know how much they should lead the target.

By using a stereoscopic telescope, an observer can, however, determine when the tracers are passing the target and is therefore able to know where the bullets are going with reference to the target. In other words, he is observing the tracer at a known point on the trajectory, i. e., when the bullets pass the vertical plane containing the longitudinal axis of the target. Time of flight is therefore eliminated from the problem. By using stereoscopic observation for directing automatic guns, the percentage of hits can be greatly increased. It is difficult, if not impossible, to accomplish accurate fire, even with stereoscopic observation, unless a director is used for computing the lateral deflections, and vertical deflections plus superelevation. The plots of these deflections are curves, which are different for every course taken by the airplane. Those who have witnessed firings in which guns are trained upon the target using director fire, know the machine-like accuracy with which the streams of fire follow the course of the airplane. The shots may be too much ahead or behind the target, but their position relative to the target remains constant along the course. This regularity can only be obtained by using a computing machine capable of solving the four-dimensional problem involved, which can never be done by a single gunner by simply pointing the gun at the target and guessing at the proper deflections, which are constantly changing in value.

This design has been so arranged that the stereoscopic observer has two knobs, one of which introduces a lateral and the other a vertical spotting deflection into the system. Thus this operator, as firing starts, can observe where the tracers are going relative to the target, as they pass it. If the streams of fire are following behind, he can introduce a lateral deflection sufficient to bring the tracers on to the target; if too low a vertical deflection spot will raise the streams of fire up to the target.

This is the first antiaircraft weapon and fire control system for automatic guns, which permits spotting corrections based on stereoscopic observations to be introduced instantaneously into the system.

*Orientation of Fire Control Instrument.* Orientation between the guns, the height finder and the director is secured by bore sighting one of the four guns on the sun, a star or other distant point. With all deflection scales set at zero, the height finder is directed at the same point. Couplings are arranged in the shafting to permit orientation. The angular height telescope has been left on the director so that it can also be trained upon the same point. Adjustable couplings are placed for this purpose in the

gear trains. After the guns have once been oriented with the director and height finder and the couplings tightened, there should be no further necessity for future orientation. With this system, the instruments are geared and thus locked together, and to the guns. The guns and fire control instruments are always oriented and ready for fire as soon as the height finder can be trained upon the target.

*Methods of Fire.* The method of firing at airplanes with this combination of machine guns and fire control instruments has already been described. It is believed that this automatic weapon with its great volume of accurately controlled fire, will be found effective when used to combat tanks, armored cars, or other high speed moving targets on the ground. The range of the object on the ground to be attacked can be measured using the 3-meter stereoscopic range and height finder. A range scale for firing at objects on the ground is provided on the vertical deflection dial of the director. The vertical rate setter has only to place the pointer at the indicated range by turning the vertical rate handwheel. If the height finder is then pointed at the target, the gun will be laid automatically at the proper quadrant elevation. The present director is not designed for use against terrestrial targets. But such a director can be produced, which will be equally suitable for firing at targets on the ground or in the air. With the present arrangement the horizontal deflections for ground targets can be estimated and introduced into the system as a lateral spot by the height finder operator. By firing a short burst, the height finder observer will know where his bullets are going relative to the target, and can correct the lateral deflection accordingly. Tank guns fire without the aid of any fire control instruments. To the tank gunner the ranges are unknown. Therefore, the multiple machine gun mount should be able to deliver a great volume of accurate fire against the tank and outfight it, especially at the longer ranges. The modern light tank carries one-half inch of armor, which can be penetrated by the caliber .50 armor-piercing bullet at a range of one thousand yards.

This weapon should be very effective when used for attacking organizations marching on roads. For Militia, National Guard, and the Organized Reserve, it would seem to be an almost ideal weapon giving a highly mobile unit, which could be used for repelling attacks by forces on the ground or in the air. The Coast Artillery Corps should also find this weapon of value outside of its antiaircraft uses for repelling attacks of landing parties in small boats, as the mobility of the weapon would permit rapid concentration at threatened points along the coast.

The new weapon combines high speed, cross-country mobility with great fire-power, which can be accurately controlled. It can deliver accurate fire upon moving targets on the ground or in the air. It should, therefore, find a wide field of usefulness among the mechanized weapons which will be required in future conflicts.

# Filters and Sound Locators

*By* MAJ. G. B. ROBISON, C. A. C.

EDITOR'S NOTE: *Ah wah! Ah wah! and just what we were looking for. For sometime we have been looking for someone to rise to this Oozlefinch bait. Private Oozlefinch, we think, is suffering from an ingrowing pessimism, which is not shared by the bird from which he takes his name. Major Robison has undertaken to set him right in language not too technical—another "adventure in science." At the same time the major gets considerable riled. See what he says in his letter:*

*"I hope I don't mind criticism if it comes from a critic who knows what he is talking about even if it is severe. But I sure get peeved when it is couched in terms which are an insult to my intelligence and at the same time indicate the abysmal ignorance of the critic on that particular subject. What am I talking about? Pardon me, sir, I am referring to the remarks of the Oozlefinch in the April issue, anent using filters with sound locators. Personally, I feel that no good purpose is served by printing such short-sighted stuff. The* JOURNAL *has a lot of readers who are too inexperienced in the various technicalities of our work to understand the fallacies set forth. They are quite apt to get the subconscious idea that the Corps is such a bunch of bunglers, hidebound and lazy, that even its* JOURNAL *recognizes it officially. Don't tell me that the value of publishing such stuff is proved by my submission of an article elucidating one of the points in question. The possible damage is too great to be offset by occasional replies. There are other points (in Oozlefinch's letter) etc. etc."*

*With the latter part of this statement we do not agree. The Editor of the* JOURNAL *is looking for informative articles, it is true. We intend to have them, by hook or crook—even to the extent of using a "filter." Who knows? Perhaps we may learn something after awhile. Private Oozlefinch is still at St. Elizabeth and recently sent us a scheme of his own to improve the general situation. Due to the obsession which is principally responsible for his confinement he does not register normal sensitivity. We expect to publish other exudations of his.*

THE Oozlefinch from his perch in St. Elizabeth's, with a date line flavored with foolish independence, frets about our failure to use the pretty filters with our sound locators. (See You Tell Em, April issue, the COAST ARTILLERY JOURNAL). While we will admit that our locator che-ild ain't quite the prodigy we would like to have him, we must spring to his defense against such a widely circulated, unjust criticism. The idea is such a beeyoutiful one that it could easily spread beyond the walls of St. Lizzy and infect a lot of innocent women and children.

Now gather around close and hear the lowdown. I'll make it as low as possible and let him curse, who will, the resulting inaccuracies of expression. Once upon a time (1922), the Chief's office decided that something should and might be done to develop better locators for the detection of aircraft. They erred, perhaps, in not consulting the Oozlefinch right away. They contented themselves instead with sending two officers to study at the University of Iowa under Dr. G. W. Stewart, head of the Physics Department and a famous expert in the field of acoustics (fancy name for sound). These officers were later joined there by one officer (each) from the Field, the Ordnance, the Signal Corps, and the Navy. They studied acoustics theoretical and acoutics practical, radio amplification, pertinent articles in technical journals for the preceding twenty-five

(count them) years, wartime acoustic devices, subaqueous listening developments and (can you believe it) filters, acoustic and electrical. Isn't that mean?

Do you know what a filter is? Well, if you don't, it's a gadget that takes something out of something else. I'm afraid that definition is a bit loose, as the saying goes, because it might apply to mama's hand in papa's wallet.

One type of filter is called an acoustic filter because it filters out certain of the audible sound frequencies. It has no wires or condensers or tricks like that. If you took a pasteboard tube and tried to talk through it, your words would probably sound as though you had mush in your mouth because the tube would act as an acoustic filter and prevent some of the frequencies from passing through. Dr. Stewart has done an immense amount of work on the acoustic filters. In general, they consist of a tube with holes in the wall. Around the first tube is a second which is divided into compartments into which the holes in the first tube open. Of course there are a number of different kinds and the whole thing is rather complicated.

Another type of filter is the electrical filter. It filters currents of certain frequencies out of others. Instead of using holes and enclosed volumes as in the acoustic type, condensers and inductance coils are used. You know, a great many radio stations broadcast at the same time. When you want a particular station you turn a knob which (usually) turns the movable plates of a condenser, thus varying its effective size. When you have set the proper number you will get the station which you want and no other *if*, 1, your set is in proper working order; 2, the station is broadcasting; 3, the station strength is great enough to reach your set with effective volume; 4, no other station on a nearby frequency drowns it out; and 5, if the static—meteorological and man-machine made—is not too bad. There may be some other ifs, perhaps the kid is just getting to sleep or you and she can not agree as to whether jazz or symphony is better, but we have enough. We will return to this subject—just remember that your radio station control knob adjusts the moving element of one type of electrical filter.

Filters of electrical or acoustical frequencies may be and are also classified as high frequency pass, low frequency pass, and band pass filter. When the filter passes all frequencies above some definite high frequency, it belongs to the first class mentioned. When it passes all frequencies below a certain chosen low frequency, it belongs to the second class. If it passes nothing below one given frequency and nothing above another higher given frequency, and passes only the band of frequencies between those two values, it is a band pass filter. This band may be wide or narrow. To tune in a certain radio station and keep out the others, a good and very narrow band pass filter is necessary. Many of these filters are highly com-

plicated and costly and some of them are quite bulky. They involve the use of tubes and a source of electrical power. These are somewhat objectionable for field use but we will consider later the real nigger in the woodpile.

Strange as it may seem to the Oozlefinch, the locator itself is an acoustic filter of the high frequency pass type, only the lower frequency limit is designedly away down around forty cycles per second. If the horns were shortened it would raise the cutoff point. This was tried in order to reduce the bulk of the horns but so much of the sound energy was cut out that the horns of the latest model have been restored to practically the original length.

In case you have never seen a locator, it consists of four aluminum horns very much alike. They are called exponential horns because of their shape and they *are* exponentially shaped because that allows the maximum amount of the sound energy received to pass to the ear, other things being equal. Two of the horns are used for elevation and two for azimuth, each pair effecting the other.

These horns are most effective in the direction in which they are pointed and subdue sounds which are off to the side. While this effect is somewhat similar, it is not true filtering.

Are you all set now to think about the sound source, namely, the airplane? Suppose it is coming at the locator, full tilt, with engines roaring. The explosions from the cylinders make quite a racket and a good big portion of the sound energy from the engine lies among the lower and intermediate audible frequencies. Naturally we want to use these frequencies when they are available and it would not be so hot to filter them out when they come from other bothersome sources because those from the target would be the first to go with the rest following. Not long ago mufflers were put on the engine but they were not very effective. In fact, the locators carried the target farther than when it wasn't muffled. It probably can and will be done, however, and then what will happen? Well, the aviator can muffle his engine now by gaining his greatest altitude and, when he nears the maximum range of the locators, throttling his engine down very low and gliding in, losing altitude. This really does more than merely muffle the engine, it eliminates the biggest part of the noise entirely. But his propeller is still turning slowly and making some noise and, as the wings and struts and other surfaces of the plane slip through the air at high speed, whistling noises are produced similar to those heard around a building in a gale. These noises range from the intermediate to the high frequencies. They do not carry as far as the engine noises but their range is usually not inconsiderable. Since they are all that is left when the engine is shut off, we must not put ourselves entirely out of action by filtering out intermediate and high frequencies coming from bothersome sources. Enter the woodpile coon, large as life and twice as

natural. Tell me what frequencies we *can* filter out without weakening the effectiveness of the locator. Those parasitic noises, the singing of the Oozlefinch, the noises from truck engines, from other planes, from railroad trains, from humming telephone wire, from chickens and dogs—they all extend over part or all of the frequencies which we try so hard to get from the proper target. Friend Oozlefinch's suggestion amounts to killing the patient to cure the measles.

Perhaps this may sound fairly convincing and yet you still have a feeling that radio does it pretty successfully and there ought to be some way to do it here. It's rather tough to explain that end of it simply with any degree of accuracy but here is a try. Each radio station is supposed to broadcast on a certain fixed and very definite frequency. This frequency is that of the carrier wave which you never hear. The program put into the microphone is composed of a wide range of audible frequencies but they only modify—modulate—put wiggles on—the carrier wave *without* changing its fundamental frequency. You filter out (more or less) the carrier waves of other stations because you want only one frequency, let that one you want into your set, and said set obligingly turns the wiggles back to audible frequencies. Now, if there were parasitic noises in the program room your filter wouldn't help to eliminate that. There is the rub. Our "program room" is at the large end of the locator horn and all the noises are in the room. If we could put a microphone in the attacking plane all would be well. A way to do this is still to be devised.

Or, you can look at the matter another way. Suppose two equally powerful stations (as measured by your set) were broadcasting at the same time on practically the same frequency. Could you filter out one and not the other? Well, suppose there were several stations and they were all the same frequency? All planes and most of the bothersome parasitic noises have practically the same frequencies. How can you tune or filter out one without doing the same thing to the other? Will your radio filter out all static? If you are near a very powerful station the volume level will be high enough to free you from its annoyance but it has not been filtered out, it has been drowned out. These filters are wonderful affairs but they are not without limitations.

Oh, mister, ain't there no hope a-tall? Won't some brave cowboy on a pony with a white nose ride over the hill and save our Nell? Where is Rin Tin Tin? Ain't the Guvnor got no pardons left?

Tush, tush and pish, pish. Have you never heard of the magnificent inventive genius of the American peepul? What of the lexicon (what in health is a lexicon, anyway) of the bright youth who had no can't? Courage, mon brave!

All joking aside, although the problem is a werry, werry nasty one, it is not totally impossible that a solution might be found. Something more might be done with shielding. And there *is* a filter which distinguishes

between two sounds of the same frequency even when they are doing their stuff at the same time, even when they are about equally loud, even when one is considerably louder than the other and the weaker sound is the one desired. But you will be disappointed when I tell you what it is because we have had it a long time and always use it with the locators. To end your suspense, it is the human ear. The eye can not see the colors of the rainbow in the white light of the sun without artificial aid. But the ear can pick out the sound of a violin in an orchestra, or concentrate on the piping of the piccolo, or the boom of the drum. In a room of fifty talking women (redundant expression) each one can listen to what she is saying in spite of all the others. Yes, dear friends, the ear as a filter knocks the spots off all the others. If it can be discovered how such a mechanism works or even if some means can be devised to intensify this effect, it will go far to increase the usefulness of our locators and a lot of other things. But it might be simpler to invent a totally new type of locator. Now go on with the story.

*MILITARY WEDDINGS ARE REGULATED "BY THE NUMBERS" IN ENGLAND*

*It is notified in an Army Order that, as the index figure for the cost of living, as published by the Ministry of Labour, was 66 on January 1, 1930, the rates of marriage allowance for soldiers for the marriage allowance year, April, 1930, to March, 1931, will be those shown under the figure 70 in the sliding scale contained in the Regulations for the Allowances of the Army. These are the same rates as are at present in force.*—From the *Army, Navy and Air Force Gazette.*

# COAST ARTILLERY ACTIVITIES

## Office of Chief of Coast Artillery

*Chief of Coast Artillery*
MAJ. GEN. JOHN W. GULICK

*Executive*
COL. H. L. STEELE

*Organization and Training Section*
MAJ. S. JARMAN
MAJ. E. W. PUTNEY
MAJ. J. B. CRAWFORD
CAPT. J. H. WILSON

*Personnel Section*
LT. COL. H. T. BURGIN
CAPT. H. N. HERRICK

*Plans, Finance, and Materiel Section*
MAJ. J. H. COCHRAN
MAJ. C. H. TENNEY
CAPT. F. J. MCSHERRY

*Intelligence Section*
MAJ. S. S. GIFFIN
CAPT. H. N. HERRICK

### Chief of Coast Artillery Attends Dinner Given by New York's Governor

At the invitation of Governor Franklin D. Roosevelt of New York, the Chief of Coast Artillery, Maj. Gen. John W. Gulick, attended a testimonial dinner given in Albany on April 5 in honor of Adjt. Gen. Franklin W. Ward. Former Governors Whitman, Miller, and Smith were also present to do honor to General Ward.

General Ward was a member of the Coast Artillery National Guard of New York for a number of years and was closely associated with General Gulick when both served on the War Department General Staff in Washington.

### Cooperation

It has been said very often that in the Army, the various arms and departments spend all their time fighting with each other. The old system of promotion (by branch) was blamed for this condition to a great extent and many believed that the single promotion list would go far towards eliminating branch hostility. There seems to be no way to discover who throws the monkey wrench of discord into the machinery of cooperation. Everyone who speaks of it regrets it. Then who does it?

In the Coast Artillery Corps there is more opportunity for friction to develop than in some of the other arms due to its contacts with both the Navy and the Air Corps. Joint exercises bring the Coast Artillery in close contact with both. Contacts may act either for greater cooperation

and understanding or they may be the means of widening a breach. It all depends on the attitude of mind of those participating. The Chief of Coast Artillery and the personnel of his office are anxious to preserve the cordiality of relations which exist at present and in increasing the good-will which is conducive to our progressive development.

It is interesting to note that when tactics are considered, the Coast Artillery stands in the same relationship to both the Air Corps and the Navy. Sea Coast Artillery defends certain important establishments along our coast line from attack by hostile naval forces, leaving our main naval forces foot-loose and free to seek out the hostile naval forces far from our shores and defeat them. Antiaircraft artillery defends certain important establishments from attacks from the air leaving our main air forces free to seek out the hostile air forces and defeat them before they can be launched against our most vital and sensitive areas. If we should be so unfortunate as to suffer defeat on the sea or in the air then the Coast Artillery is the ace in the hole which will beat off the hostile attacks or furnish cover behind which our Navy or Air Forces may be reformed and await a favorable opportunity to again assume the offensive. Joint action to be successful requires cooperation—not a lackadaisical cooperation given half-heartedly, but, in addition, a mental sympathy, appreciation, and respect on all sides.

Much of the apparent hostility which existed a few years ago is disappearing. It probably did not exist to as great an extent as it seemed. Much of it resulted from banter and an excusable pride in accomplishment. Probably there was a little boasting on both sides. Very likely some of it was bolony. In the present stage of air defense development there is no need for camouflage or deception. The Air Corps has arrived and so has the antiaircraft artillery. They might have laughed once but not now. Having the tools to work with, the outlines of a definite system of air defense tactics is taking form.

Both the Air Corps and Coast Artillery Corps should be interested in the joint exercises to be held at Aberdeen. These exercises have been most carefully planned and are more extensive than any ever held before. In order that they may be of the greatest possible value to both arms a spirit of cooperation of the highest order should exist.

The Coast Artillery has enjoyed the pleasantest of relations with the Navy. Joint Army-Navy exercises in Panama have become a regular feature of the annual visit of the fleet to those waters, of recent years. A number of the lecturers before the Coast Artillery School have been naval officers who informed the students of naval tactics, gunnery methods, and other technical matters pertaining to the Navy. During the past winter, Capt. A. C. Stott, U. S. N., lectured before the school on Naval Tactics, and Lieut. Comdr. H. A. Flanagan, U. S. N., spoke on Naval Gunnery.

In Panama and other places the Navy has been very generous in per-

mitting Coast Artillery officers to accompany them during maneuvers and battle practices. When it is realized that space aboard a naval vessel is generally at a premium it can be realized that these invitations were extended in the real spirit of hospitality.

Within the last few months the Navy has again taken up the development of a high speed Coast Artillery target. Capt. H. S. Howard of the Construction and Repair Division of the Navy Department has been experimenting with models of the target. Early in April Major Putney, Major Crawford, and Captain Wilson of the office, Chief of Coast Artillery, witnessed the test of a model which was towed in the Tidal Basin, Washington. Captain Howard has taken much interest in the experiments which give promise of producing a target for the Coast Artillery which can be towed at both high and low speeds.

Several officers on duty at the Coast Artillery School were guests of the Navy during February and made the trip to Guantanamo with the Scouting Fleet where they witnessed the battle practices held there. In appreciation of the courtesy shown these officers the following letter was prepared and forwarded to the Navy Department:

THE COAST ARTILLERY SCHOOL
Fort Monroe, Virginia.

March 10, 1930.

Subject: Report of Detail of Officers to Witness Naval Target Practice.
To: Chief of Coast Artillery.

1. Captains John T. Lewis, Herbert F. E. Bultman, Douglas M. Griggs, and 1st Lieut. Isaac H. Ritchie, C. A. C., returned from a trip of observation of target practices with the Scouting Fleet on March 5, 1930. A report on details of this trip which are of interest to the Coast Artillery is under preparation and will be forwarded for your information.

2. The above-mentioned officers were enthusiastic about the great value of this experience professionally and highly praised the courtesy of the Navy in doing everything possible to provide for their comfort. Every effort was made to make all materiel and information thereon accessible to all the observers. Arrangements were made to enable these officers to witness the maximum possible number of practices during their stay with the fleet.

3. It is recommended that the Commanding Officer, Scouting Fleet, be thanked, through the Navy Department, for the courtesy shown the above-mentioned officers on their recent trip and for the interest displayed in making all possible information available to them.

H. D. TODD, JR.,
*Major General, U. S. Army,*
*Commandant.*

1st Ind.

War Department, O. C. C. A., March 15, 1930—To the Adjutant General.

The Chief of Coast Artillery appreciates the whole-hearted cooperation exhibited by the Navy Department and the Commanding Officer, Scouting Fleet, in the matter covered in the basic letter, and is thoroughly in accord with the recommendation made in Paragraph 3.

ANDREW HERO, JR.,
*Major General,*
*Chief of Coast Artillery.*

## School Details for the Year 1930-31

Although the school details for next school year have not been completed, orders have been issued designating students for the various schools and courses as shown below. A few vacancies exist at this writing (April 9) which may be filled before this list appears in print. The recommendations for school details are prepared by the personnel officer, office of Chief of Coast Artillery, as nearly everyone knows. It is not so simple as it may appear to some who glance at the list. Various recommendations are received, officially and gratuitously. The Commandant, Coast Artillery School, makes recommendations for the selection of students for certain Advanced Courses. The regulating War Department policies must be consulted in all school details. The foreign service roster has its innings. In addition there are many personal requests made for this duty and that or some other. These requests may be made officially or informally, by letter or in person. Each request is given consideration and an effort made to comply with it, when practicable. The personnel office is run on the theory that an officer does his best work on the detail in which he is most interested. This increases the personnel officer's difficulties but he does his best to satisfy everyone—an impossible goal but one which is attempted. One would think that little Johnnie could go to school almost anywhere. He is only eight and bright for his age. But no. So the machinery begins to creak and groan to discover what can be done about it. Frequently something *is* done.

COMMAND AND GENERAL STAFF SCHOOL

Maj. Frank Drake
Maj. Ward E. Duvall
Maj. John H. Hood
Maj. Edwin C. Mead
Maj. James C. Ruddell
Capt. Henry F. Grimm
Capt. Vernon W. Hall
Capt. William Sackville
Capt. John L. Scott
Capt. Evan C. Seaman
Maj. Gordon deL. Carrington

QMC MOTOR TRANSPORT SCHOOL

2nd Lieut. Bienvenido M. Alba (P. S.)

AIR CORPS TACTICAL SCHOOL

Maj. Barrington L. Flanigen
Maj. Charles A. French

SIGNAL CORPS SCHOOL

(1) .....

MASSACHUSETTS INSTITUTE OF TECHNOLOGY

(3) .....

.....

.....

ECOLE DE GUERRE

Maj. Eugene Villaret

ARMY INDUSTRIAL COLLEGE

(2) .....

.....

COAST ARTILLERY SCHOOL

*Advanced Course*

Maj. Carl S. Doney
Maj. Martin J. O'Brien
Maj. Edgar H. Underwood
Capt. Carl R. Adams
Capt. Ernest R. Barrows
Capt. Thomas R. Bartlett
Capt. Louis J. Bowler
Capt. Albert C. Chesledon
Capt. Valentine P. Foster
Capt. Russell T. George
Capt. Byron T. Ipock
Capt. Frederick Lofquist
Capt. William R. Maris
Capt. Bryan L. Milburn
Capt. Adrin B. Smith
Capt. Lessley E. Spencer
Capt. Joseph C. Stephens
Capt. Edmund H. Stillman
Capt. Frederick L. Topping
Capt. James R. Townsend
Capt. Arthur V. Winton

COAST ARTILLERY SCHOOL

*Battery Course*

Capt. Harold G. Archibald
Capt. John T. deCamp
1st Lieut. William J. Brady
1st Lieut. Lathrop R. Bullene
1st Lieut. James Boyce Carroll
1st Lieut. John F. Cassidy
1st Lieut. Robert W. Crichlow
1st Lieut. Frederick B. Dodge, Jr.
1st Lieut. James L. Harbaugh, Jr.
1st Lieut. John I. Hincke
1st Lieut. James L. Hogan
1st Lieut. William G. Holder
1st Lieut. David Hottenstein
1st Lieut. James F. Howell, Jr.
1st Lieut. Frederick R. Keeler
1st Lieut. George J. Kelley
1st Lieut. Lyman L. Lemnitzer
1st Lieut. James E. McGraw
1st Lieut. Ernest A. Merkle
1st Lieut. Ola A. Nelson
1st Lieut. Arthur B. Nicholson
1st Lieut. Douglass G. Pamplin
1st Lieut. James G. Renno
1st Lieut. William L. Richardson
1st Lieut. Logan O. Shutt
1st Lieut. William H. Webb
1st Lieut. Charles M. Wolff

COAST ARTILLERY SCHOOL

*Advanced Gunnery Course*

Capt. Eugene T. Conway
Capt. Leonard L. Davis
1st Lieut. Robin B. Pape

*Advanced Engineering Course*

Capt. Frank A. Hollingshead
1st Lieut. Edward Barber
1st Lieut. David B. Latimer
1st Lieut. Everett C. Wallace

*Advanced Motor Transport Course*

Capt. Norman E. Hartman
Capt. Parry W. Lewis
Capt. Harry E. Pendleton
1st Lieut. Joe D. Moss

## Master Sergeant Mapes Retires

Many readers of the COAST ARTILLERY JOURNAL will recognize the features of the old-timer shown above. On the morning of April 16, 1930, the Chief of Coast Artillery, Maj. Gen. John W. Gulick, shook him warmly by the hand and congratulated him upon the completion of over thirty years' active service. General Gulick expressed regret at the ending of an active career as outstanding as has been that of Master Sgt. William E. Mapes. Sergeant Mapes first entered the service on May 18, 1898, and with the exception of the first year has served with the Coast Artillery Corps. He has been a noncommissioned staff officer since 1903 and for the past nine years has been on duty in the office of the Chief of Coast Artillery.

Sergeant Mapes' service has been highly commendable in all respects. He has performed his various duties with great intelligence, with that loyalty and devotion to duty which are characteristic of the traditional high standards of the Coast Artillery non-commissioned staff. It is hard to lose the services of such men as Sergeant Mapes. We wish to express

to him for the entire Coast Artillery Corps our good wishes and appreciation of the service he has rendered and to assure him of our warmest interest in his future health and prosperity.

## The Coast Artillery School

### Antiaircraft—"Cock o' the Walk"

Little sigma and big sigma become the "sine qua non," the pampered pet, the "nulli secundus" of the Coast Artillery School. The invariable greeting of the Assistant Commandant to Department Directors is "We must have another hour (day or week) out of your course for antiaircraft instruction." Directors and instructors weep as their pet courses are slashed and belittled by ruthless antiaircraft-minded authorities. Herewith an example of the air-conscientiousness of the school staff; Capt. John T. Lewis, antiaircraft instructor, recently found, on starting his conference on the Director T-IV, hidden among the students, two instructors from the Department of Tactics, two from the Department of Engineering, one from the Department of Extension Courses, and one from the Department of Enlisted Specialists, all surreptitiously seeking words of wisdom. An unprecedented event. Epsilon sub P has its day.

### Special Courses Popular

Students of the Battery Officers' and Advanced Courses are becoming more enthusiastic over the various special courses offered at the Coast Artillery School and elsewhere which are open to them upon graduation. Competition for these courses has been especially keen this year, the number of applications indicating a growing desire for officers both to improve their mind and possibly to get an extra line o' type under their names in the Army Directory. Nor does the absence of examinations and equitation detract from these "gentlemen's courses."

The Advanced Gunnery Course, better known as the "Gypsy" course on account of the wanderings of the students, both mental and physical, has among other attractions the annual observation trip with the Navy to Cuba, a period of calculus and ballistics at Aberdeen, and an opportunity to get acquainted with the high command in Washington. The majority selected for this course are in the grade of captain in order that they may be available as gunnery officers on District Staffs and instructors in the Department of Artillery.

The Advanced Motor Transportation Course has a particular appeal to the officer who as a boy was wont to take clocks apart. The best evidence of the value and practicability of this course is an officer who, believe it or not, is now an esteemed regimental motor transport officer, and who had never driven an automobile before his motor transport course at the Coast Artillery School.

The Advanced Engineering Course, consisting of advanced electrical

practice, duties of Artillery Engineer, telephony, searchlights, radio, Diesel power, etc., has its share of applicants. It is hard to understand that peculiar turn of mind which makes certain men revel in vectors, complex algebra, Kirchof's law and such foolishness. Nevertheless we have them. This course includes a pilgrimage to New York City and way points where, among other things, these students try their hands as critics of the stage.

A selected few who have proved their metal for scientific punishment proceed with enthusiasm and a quick step each year to pursue the special communications course at Massachusetts Institute of Technology. After a year or more of seminar, calculus, transients, thesis, etc., he "homeward plods his weary way" with a B. S. or M. S. to a better understanding of why $1 = E/R$.

The Communications Course at the Signal Corps School, Fort Monmouth, is available for those officers who have a penchant for telephony and radio. This course is especially valuable to those who desire a detail with the Signal Corps.

A recent policy restricts detail with the Air Corps Tactical School at Langley Field, Virginia, to officers of the field grade who are graduates of the Advanced Course (field officers) of the Coast Artillery School or the Command and General Staff School. Flying pay has its attraction in this course. Officers attending this school must accept rental allowance in lieu of quarters.

## Harbor Defenses of Long Island Sound, Fort H. G. Wright

Minor Joint Army and Navy Exercises will be held in the Harbor Defenses of Long Island Sound on May 26, 27 and 28. Special emphasis is to be placed on the coordination of air forces and the antiaircraft defense, and on the support of army forces by naval coast defense forces.

The Scouting Fleet will constitute the BLACK forces. The BLUE army force will consist of the Harbor Defenses of Long Island Sound, with all armament and accessories manned by sufficient personnel to represent its operation, and an attached air force consisting of one bombardment squadron, one pursuit squadron, and one observation squadron.

Due to the lack of available vessels, the Naval District Offshore Patrol will be assumed, and during the first phase of the exercises its intelligence functions will be represented by reports made directly from the BLACK forces.

The exercises will be conducted in a series of short phases and not as a continuous operation. There will be no umpires, no penalties will be imposed, and no decisions as to the results of the operations will be made either during the exercises or after their termination. A BLACK observer will be stationed with the BLUE forces, and a BLUE observer will accompany the BLACK force. These observers will conduct a critique at Fort H. G. Wright after the completion of the exercises.

The tactical situation will be such that the Army forces have paramount

interest under the provisions of Joint Action of the Army and the Navy. The exercises are expected to afford an excellent test of organization, interchange of intelligence, and tactical employment of the combined arms in coast defense.

## Harbor Defenses of Balboa

Since we last heard from our correspondent at Amador the most important events which have taken place on the Pacific side were the battle practice and the annual affair with the Navy. For the battle practice the 1st and 2nd Coast Artillery came over from the Atlantic side and assisted in defending the Canal. Col. Robert E. Wyllie commanded the defenses during the practice. This year the problem, briefly, consisted of an attempt on the part of the theoretical enemy to sink block ships in the prism of the Canal. This nefarious plot was properly thwarted by the big gun men.

Following the battle practice the Harbor Defense War Plans were dusted off and given their annual workout against the real ships which form our Battle Fleet. Again the Atlantic Siders came to the rescue of the Pacific side. Opposing air forces were also engaged, faking realistic dog fights all over the place and being downed by the antiaircraft men. The period of the joint exercises extended over forty-eight hours, a grand attack by the entire fleet being the closing incident of the very instructive session. The impressive spectacle of the entire fleet at anchor in Panama Bay under the guns of Flamenco is one that is not easily forgotten. It is especially striking at night under a Panama moon that seems as large as—but we must be getting on.

Following the maneuvers the 4th Coast Artillery batteries began on their preparations for secondary practices with the .155 guns. Further deponent sayeth not.

## Harbor Defenses of Honolulu, Fort Ruger

We have an interesting letter from Col. H. E. Cloke, commanding the Harbor Defenses of Balboa, in which he laments the lack of news which exists in the Paradise of the Pacific. However, there are some gleanings which we assay as of interest, hoping our readers will agree. Even the name of the Harbor Defense Commander is of interest. Recently several people who haven't kept in close touch with personal affairs have said, "Where is Colonel Cloke now?" In reply we inform them that he is in the general vicinity of Waikiki Beach and informs us that brass shining is going on as usual. He further informs us that Waikiki Beach is not washing away and even if it were Fort DeRussy has the finest beach in Hawaii.

Like every place else a strong bull market in antiaircraft stock has had its effect on Diamond Head. They have a couple of guns for drill and a complete fire control set up. Captain Schoonmaker, recently of Fort

Monroe and the 61st, finds his antiaircraft experience very useful and is now senior antiaircraft instructor. Colonel Cloke says that interest in antiaircraft is running high and that firings will begin shortly.

In the seacoast line one battalion of the 55th stationed at Ruger will soon hold its service practices, and is said to be in a high state of efficiency. Maj. Rodney Smith commands this battalion. The 16th Coast Artillery held its preliminary practice on March 19 and its record practice on April 10. The Harbor Defense Commander was pleased with the results and the general conduct of the practice. He mentions the following: The order designated 8:30 a. m.; no interference by small boats; no trouble with targets; no trouble with radio communications. The Harbor Defense Commander being an old hand at target practices had taken his lunch with him but threw it away and went home to lunch.

On March 27th the regiment was reviewed by the Coast Defense commander who invited 1st Sgt. Martin F. Melia to "stand up" with him. The occasion: Sergeant Melia's last review after twenty-nine years' service, twenty-eight of which were in the Coast Artillery. Sergeant Melia served overseas with the Coast Artillery and participated in the St. Mihiel and Baccava drives. The Harbor Defense commander writes of him: "Such fine men in the service are hard to replace. The whole command regrets his leaving."

## The 13th Coast Artillery (HD), Fort Barrancas

Our correspondent informs us that he is now 1st Lieut. Felix N. Parsons, officially designated by Lieut. Col. Hartman L. Butler, the Commanding Officer, as publicity officer for the Harbor Defenses of Pensacola.

We note that the Honorable Tom Yon, the member in the House of Representatives from the 3rd Florida Congressional district, has again visited Fort Barrancas. Mr. Yon is much interested in the Army, including the welfare of the personnel and the upkeep of fortifications and materiel. During his last visit he investigated the condition of Battery Langdon and the need for a new dock and railroad. The old dock and railroad were destroyed during a storm in 1926 and have never been replaced. This battery is at present inaccessible for service due to lack of transportation facilities. It is one of the most modern of the installations in the Harbor Defenses of Pensacola. The personnel at Barrancas is always glad to see Mr. Yon and give him first-hand information on the defenses. The Coast Artillery everywhere is glad to receive visits from representatives in Congress. When such interest is displayed it gives us an opportunity to show that it is "not all done with mirrors."

Battery "B" has not waited until July 1 to begin its antiaircraft training. Capt. J. D. Brown has held machine gun firings on balloons and qualified one hundred per cent of the sixteen men firing. He found the Forward Area sight (which is the one generally used although not adopted as standard) rather unsatisfactory, so improvised a sight from the descrip-

tion of one published in the *Infantry Journal* (November). This improvised sight is the work of Maj. Leonard R. Boyd and 1st Lieut. Joseph I. Greene, Infantry. These officers voice objections to the Forward Area, Peyeru, 1925E, and similar sights and find them wanting in the following respects: "Their low position on the water jacket causes the firer's aim to be obscured by the smoke of firing. This low position also makes the firer's necessary position of aim at high angles of fire extremely awkward and sometimes impossible to assume. Furthermore, the theory and manner of use of these sights is in general so complex that experienced gunners become confused even during peace-time firing. Continued estimations of target speed and slant range with corresponding applications either by adjustment of the sight or by complete change of aim are necessary to insure accuracy of fire. To make these mental estimates and to apply them requires a time period of several seconds."

Captain Brown found the Boyd-Green sight more satisfactory than the Peyeru. The present status of the development of the antiaircraft machine gun sight is discussed in Section XXVI, Gunnery Fire Control and Position Finding for Antiaircraft Artillery. None of the present sights or systems now in use have been adopted as standard. It is hoped that during the fiscal year 1931 funds will be available for further development of a standard fire control system and sight for antiaircraft machine guns.

In this connection it should be understood that the Coast Artillery is concerned with the development of a suitable sight and fire control system for the *.50 caliber* machine gun and not the .30 caliber gun with which Coast Artillery troops are provided at present and with which the Infantry is armed. The greatly increased range of the .50 caliber gun introduces a fire control problem more difficult than that of the .30 caliber gun. It is hardly necessary to call attention to the fact that the .50 caliber gun (or larger) is the standard machine gun for antiaircraft troops.

Battery "B" followed balloon firing with firing on the towed sleeve target. Preliminary and record practices were held using the modified Boyd-Green sight in connection with tracers. The sight was very useful in obtaining the initial lead, which resulted in a saving of time in "getting on" the sleeve with tracers. Due to the limited time available for perfecting and experimenting with this sight the Battery Commander decided to use tracer for the adjustment of fire. The score of the first record practice was fifty-one, that of the second, thirty-three. An extension on the shoulder rest of the tripod mount was installed which fitted over the shoulder of the gunner thus assisting him in aiming his gun.

The U. S. S. *Pensacola* was in Pensacola Harbor from March 31st to April 4th. During its stay the officers of the post were given an opportunity to visit the ship and see the modern fire control installation. It may be of interest to note that Capt. Alfred G. Howe, U. S. N., Commanding Officer of the U. S. S. *Pensacola*, was a former resident of Fort

Barrancas. More than twenty years ago, Captain Howe's father, Col. Walter Howe, U. S. Army, retired, was Commanding Officer at Fort Barrancas.

Master Sgt. William F. Cooper, Hq. Btry., 13th C. A., retired April 5th, 1930, after thirty years' service. Master Sergeant Cooper enlisted in the 15th Co., C. A. Corps, on March 14th, 1900, and has spent his entire service with the Coast Artillery. His last five years were served at Fort Barrancas with the Artillery Engineer.

We would be unappreciative if we did not acknowledge our correspondent's favorable remarks concerning the COAST ARTILLERY JOURNAL. The Commanding Officer, Colonel Butler, began his subscription in 1902 and has a real interest in the JOURNAL'S welfare. We are pleased to learn that it is increasing its good will at Barrancas. Let us hope that the arts of alchemy will be practiced and that an intangible asset will be transmuted into one more negotiable.

## The 18th Sound Ranging Battery, Fort H. G. Wright

This battery is the "hush, hush" outfit of the Coast Artillery. It is charged with the development of the subaqueous sound ranging project, the details of which are not to be published. However, subaqueous sound ranging is not unknown in other countries who likewise carry on development and research work along this line.

Recently the battery reached a stage in which this development work can be carried on by fewer personnel. In accordance with the recommendation of the Chief of Coast Artillery the 18th Sound Ranging Battery (less the 1st platoon) has been rendered inactive and the surplus personnel transferred to the 11th Coast Artillery for absorption. The remaining personnel consists of twenty-nine enlisted men in the following grades: four electrical sergeants, one sergeant major, one master gunner, five fourth grade, four fifth grade, ten sixth grade, and four seventh grade. The officers on duty with the battery are: Maj. R. B. Colton, Capt. H. C. Mabbott, 1st Lieut. W. J. Wolfe. They have been assigned to the Submarine Mine Depot, Fort Totten, but will remain on detached service at Fort H. G. Wright.

## The 61st Coast Artillery (AA), Fort Monroe

Our correspondent from the 61st has not come through for this number. From this we conclude that everyone in the regiment is extremely busy preparing for the long trip to Fort Sheridan. In the correspondence which passes between Fort Monroe and the Chief's office, we notice considerable reference to such matters as "prime movers." The 61st is getting set to make the jump off.

If present plans materialize the regiment will begin its march on May 14 in accordance with the following itinerary:

| *Mileage* | *Place* | *Date* |
|---|---|---|
| 0 | Fort Monroe, Va. | May 14 (Start) |
| 30 | Fort Eustis, Va. | May 14 |
| 90 | Richmond, Va. | May 15 |
| 142 | Burkeville, Va. | |
| 157 | Farmville, Va. | May 16 |
| 189 | Appomattox, Va. | |
| 211 | Lynchburg, Va. | May 19 |
| 251 | Natural Bridge, Va. | |
| 267 | Lexington, Va. | May 20 |
| 303 | Clifton Forge, Va. | May 21 |
| 315 | Covington, Va. | |
| 342 | White Sulphur Sprs., W. Va. | May 22 |
| 352 | Lewisburg, W. Va. | |
| 382 | Rainelle, W. Va. | May 23 |
| 423 | Gauley Bridge, W. Va. | May 26 |
| 467 | Charleston, W. Va. | May 27 |
| 497 | Milton, W. Va. | |
| 517 | Huntington, W. Va. | May 28 |
| | Camp Knox Detachment Splits Off Here | |
| 540 | Ironton, O. | |
| 565 | Portsmouth, O. | May 30 |
| 610 | Chillicothe, O. | May 31 |
| 652 | West Lancaster, O. | June 3 |
| 687 | Dayton, O. | June 4 |
| 727 | Richmond, Ind. | |
| 742 | Cambridge City, Ind. | June 5 |
| 785 | Indianapolis, Ind. | June 6 |
| 830 | Crawfordsville, Ind. | June 7 |
| 875 | Danville, Ill. | June 10 |
| 923 | Watseka, Ill. | June 11 |
| 979 | Chicago Heights, Ill. | June 12 |
| 1045 | Geneva, Ill. | June 13 |
| 1093 | Fort Sheridan, Ill. | June 14 |

*Camp Knox Detachment*

| *Mileage* | *Place* | *Date* |
|---|---|---|
| 517 | Huntington, W. Va. | May 28 |
| 533 | Ashland, Ky. | |
| 574 | Olive Hill, Ky. | May 29 |
| 595 | Morehead, Ky. | |
| 631 | Mt. Sterling, Ky. | May 30 |
| 647 | Winchester, Ky. | |
| 666 | Lexington, Ky. | |
| 686 | Frankfort, Ky. | June 2 |
| 709 | Shelbyville, Ky. | |
| 741 | Louisville, Ky. | June 3 |
| 773 | Camp Knox, Ky. | June 4 |

The officers who will accompany the regiment on the march are:

Maj. James H. Cunningham, Comdg.
Capt. Raymond B. Bottom
Capt. Robert T. Chaplin
Capt. William F. Marquat
1st Lieut. Paul C. Howe
1st Lieut. Donald McLean
1st Lieut. Wilmer B. Merritt
1st Lieut. Isaac H. Ritchie
1st Lieut. Fred J. Woods
2nd Lieut. Paul D. Perry

The route selected was given careful consideration and has been previously reconnoitered, at least for the eastern section. Several possible routes were available across the Blue Ridge and the Allegheny mountains. In Virginia, besides the one selected, the passage might have been made through Winchester or farther north either by the National Highway or the Lincoln Highway. Major Cunningham considered the White Sulphur Springs pass the most direct. This route has become available only in the past few years. The section of the country covered is intimately associated with some of the most important events in the history of our country. Capt. John Smith covered a part of the route many times (most often by water). General MacClellan started to march along the same route several times and finally made it as far as Seven Pines. General Grant followed it from a point a few miles below Richmond and continued on to Appomattox where the ghost of the Confederacy represented by Lee's Army gave up the unequal struggle. An apportunity will be offered the personnel to visit the famous Natural Bridge of Virginia, one of the wonders of nature without which the pages of the old geography book would not be the same. Chillicothe, Ohio, is an old town for that state. It was not only the first capital of the state but was the ancient Indian capital of the Six Nations, the strongest Indian confederacy ever having a semblance of organization —reminiscent of Tecumseh and his brother, The Prophet. Chicago is very properly skirted—on account of traffic conditions rather than the one which will occur to the facetious.

It has been necessary to speed up the march slightly to permit the 61st to take part in the Military Carnival and Exposition which is to be held in Chicago the latter part of June. Maj. Gen. Frank Parker, the Corps Area Commander, is much interested in the success of this exposition and is anxious that the antiaircraft regiment arrive in Chicago in ample time to take part. Major Cunningham has made a preliminary visit to Fort Sheridan to obtain first-hand information of conditions and to confer with the Post Commander in regard to the settling of the regiment. Fort Sheridan is a real summer resort. Accustomed as they are to Fort Monroe summer weather the 61st is advised to keep their overcoats out of storage.

Antiaircraft firing can be conducted over Lake Michigan. The landing

fields at the post and at Great Lakes Naval Training station are suitable for emergency lands only. An excellent civilian field is in operation only about five miles from Sheridan. Details as to the performance of tow-target missions are not known to this writer but no doubt will be worked out satisfactorily after the regiment's arrival.

The JOURNAL wishes the regiments bon voyage.

## The 62nd Coast Artillery (AA)
## The 69th Coast Artillery (AA)
## Aberdeen Proving Ground, Md.

As you read this these two antiaircraft regiments may be found at Aberdeen busily engaged in preparations for the forthcoming joint exercises with the Air Corps.

The 69th sent a detail of fifty-five men to Aberdeen, under 2nd Lieut. K. E. Rasmussen, on March 12. This detail set to work on the building of kitchens, mess halls, latrines, and tent floors in preparation for the arrival of the entire regiment about a month later. Indoor instruction was completed in March, and the first part of April was devoted to practice in road marching with especial reference to traffic conditions to be met on the trip from Fort Totten to Aberdeen. Traffic conditions through the metropolitan district are unusual and the most skillful driving is required.

During the latter part of March the Ninth Observation Group from Mitchell Field participated in cooperative missions with the regiment. Planes flew on prearranged courses at six thousand feet for guns and one thousand five hundred feet for machine guns. The entire regimental set-up, including the radio and telephone nets and panel detachments, operated for four days.

A detachment of the regiment took part in the Army Day (April 5) parade in New York City and made a very creditable appearance.

The movement to Aberdeen was made in two columns, beginning on April 8 and 9, respectively. Overnight stops were made at Raritan Arsenal and Frankford Arsenal. The entire regiment arrived at Aberdeen on April 11.

When the 62nd arrived at Aberdeen it found the 69th on the ground and already a full-fledged outfit. Antiaircraft firings had been going on for a month which shows that the newest regiment is on its toes and full of pep. We suspect that they wanted to pull off these firings before the arrival of the 62nd so there would be no chance for the 62nd to high-hat them. The progress that the 69th has made since its organization has been remarkable. We say this on the highest authority. In substantiation we offer the following letter, written by the Chief of Coast Artillery after his visit at Aberdeen early in April.

WAR DEPARTMENT
Office of the Chief of Coast Artillery
Washington

April 4, 1930.

Lieut. Col. James B. Taylor,
69th Coast Artillery (AA),
Aberdeen Proving Ground, Md.

My dear Colonel Taylor:

In confirmation of our conversation on April 2, I desire to express to you my complete satisfaction with the progress that has been made in the organization and training of your regiment as revealed by the review and inspection on the above date.

I was very much pleased to note the enthusiasm and interest of the officers of the regiment in their work. This is as it should be.

I was also pleased with the soldierly appearance of the enlisted personnel of the regiment. You are very fortunate in having such an excellent personnel, which reflects credit on the Coast Artillery as a whole. It was a pleasure to know such an outstanding soldier as my orderly for the day, 1st Sgt. Hugh A. Britt.

You will have an excellent opportunity in the training season of 1930 to complete the organization and training of the regiment. I shall be at Aberdeen frequently and shall look forward to seeing your regiment many times during the training season.

Please convey to the officers of the regiment my congratulations on the work already accomplished.

Sincerely yours,

JOHN W. GULICK,
*Major General,*
*Chief of Coast Artillery.*

## Reserve Officers Training Corps
## University of Delaware, Newark, Delaware

Our correspondent at the University of Delaware, after some persuasion, has enabled us to turn our searchlight on the R. O. T. C. unit located there. This unit began its existence as an Infantry unit but became Coast Artillery in 1927 when Maj. Robert P. Glassburn, C. A. C., became its first Coast Artillery PMS and T. In this short time it has become one of the outstanding Coast Artillery units and has been rated "excellent" every year, beginning with 1928. Our correspondent (modestly) declares that this success is due to the spirit of the student body, the earnest support given by the faculty and the cordial relations which exist between the entire personnel of the University and the Regular officers on duty with the unit.

Now for a short paragraph of figures to prove the statement that it is really an up and coming unit. Two hundred and fifty-one students are enrolled in the unit. Of the present senior class forty per cent are taking the Advanced Course. Fifty per cent of the membership of Phi Kappa Phi, the scholastic honor fraternity, are also enrolled in the R. O. T. C. unit. Thirty-seven per cent of the two upper classes are enrolled in the R. O. T. C. and succeeded in winning forty-five per cent of the honors awarded in those classes for the year 1929—a positive indication that R. O. T. C. students do not lose interest in their other courses.

Nor do the R. O. T. C. students at Delaware excel only in scholarship. Military training develops leadership and so we find that the team captains in the three major sports are also taking the advanced R. O. T. C. course. One R. O. T. C.-er is team captain in a minor sport, two are members of the student council, six are on the staff of the student weekly, two (out of the three) are major sport team managers, and two are fraternity presidents. Sixty-five per cent of the letter men in the senior class are R. O. T. C. men—almost twice their normal share. The annual dramatic competition was won this year by an original play written by an advanced course man.

Although this unit is young as a Coast Artillery unit its progress has been rapid. As soon as he undertook the duties of PMS & T, Major Glassburn insisted that the R. O. T. C. course should be on the same level as all other curricula; that the same serious effort should be required of the student. In consequence he felt justified in asking for it the same credits as for any other course requiring equal application. As a result, the Advanced Course was raised to full elective standing by the University authorities beginning with the college year 1929 and with an increase of one-third in credits given for the course.

The officers on duty at the University of Delaware, Maj. Robert P. Glassburn, 1st Lieut. Ephraim P. Jolls and Charles M. Myers, believe that Delaware has proved that the R. O. T. C. men can take the lead in every phase of college activity—intellectual, athletic, or social. The secret, if there is one, in the opinion of Major Glassburn, is constant intimate contact with the student body, coupled with equally constant insistence upon the dignity of the Army and of the R. O. T. C. He gives generous credit to the Regular Army enlisted assistants, Sgts. Walter J. Watters and Thomas H. Kessinger, of the Coast Artillery Corps, and Staff Sgt. Edward A. Davis, of the Infantry, who by their devotion to duty and in the fine spirit of their daily relations with the student body, are a splendid advertisement for that fine body of men, the noncommissioned officers of the Regular Army.

The Chief of Coast Artillery, Maj. Gen. John W. Gulick, has accepted an invitation to be present at the graduation exercises to be held on May 27 and will present the commissions to the newly-appointed graduates.

# PROFESSIONAL NOTES

## Air and Terrestrial Spotting

Much argument and discussion has taken place in past years as to the relative value of air and terrestrial spotting in target practice and in action. Each system has its adherents who point to the good results obtained with one or the other during practices.

If the entire mission of Seacoast Artillery could be accomplished by the firing of target practices this writer would be inclined to favor the aerial system of spotting. It has many advantages, not the least being the celerity with which aerial spotting can be conducted. However, the aerial observer must be trained and have acquired a sufficient amount of skill and technique in order that his reports of deviations may be of sufficient accuracy to be useful. In recent years through the hearty cooperation of the Air Corps, aerial observation has been greatly improved.

But there are other considerations which could be taken into account before aerial observation should be adopted as standard. These considerations have to do with conditions which will exist at the time a seacoast engagement is under way. It seems reasonable to suppose that no hostile nation will undertake the landing of an overseas expeditionary force on our shores until it has gained control of the sea. Such control would be necessary to insure the security of its lines of communication and supplies of all kinds. When our enemy has gained such control it would mean that our fleet has been defeated, contained, or otherwise rendered ineffective. Under such conditions an expeditionary force could be embarked and favorable points of debarkation selected. In any attack against this country it is unthinkable that an invasion would be undertaken with any force except a large one. A large force of all arms necessitates the acquisition of a base for future operations. A base to be suitable for a large force is to be found only at one of our seacoast cities. At these points only would the necessary harbor, dock facilities, railroads, etc., be found. The War Department, years ago, anticipated the desirability of our principal harbors as bases for hostile operations and provided fortifications for them designed to furnish the necessary defense against enemy naval forces. Against hostile naval vessels our Coast Artillery Corps is the principal arm of our service to furnish this defense.

Some may be found who will dispute this last statement and call attention to our Air Corps as another arm of the service which may be used against hostile naval forces approaching our coast line. There is no lack of appreciation of the capabilities of air forces. Within certain limits, say, two hundred-three hundred miles off the coast, there is no

doubt but that air forces will operate against hostile naval forces and that, if unopposed, they will be able to cause considerable damage to the enemy expedition, particularly its transports and supply ships.

This brings us to another phase in this discussion. If it is correct to assume that a hostile expeditionary force will not approach our shores until we have lost control of the sea it is also reasonable to assume that an expeditionary force will arrive prepared to secure command of the air—at least locally or in the area selected for the landing. It would be inconsistent to make any other assumption. There may be a possible argument as to effectiveness of aerial bombardment against battleships but certainly transports, landing boats, and the area of congestion which would exist during a debarkation would be easy targets for the bombers. Therefore it would be necessary that the hostile expeditionary force control the air, at least during the close approach and debarkation and within the selected area of operations.

No attempt will be made in this article to discuss the manner in which hostile air supremacy might be obtained. Perhaps the hostile air force will secure a land base within striking distance of our coast. It may be possible to carry a sufficient force in carriers. However, it is believed that control of the air will be necessary for the debarkation of an expedition of any size. If such is the case how will it be possible for our Air Corps to furnish aerial observation for seacoast artillery? (The same difficulty will be met in the operation of any system of aerial position finding for long range firing).

Even if a hostile naval force were so foolish as to approach within striking distance, lacking command of the air, our observation aviation would still be limited in its freedom of action by the antiaircraft guns which will be found on all naval vessels in the future. It probably will not be possible for our aerial observers to remain directly over the target and report deviations to the seacoast batteries. If unable to obtain this favorable position the accuracy of observation will suffer.

It is not the intention of this article to convince anyone that aerial observation is useless and should be abandoned. On the contrary it is believed that, when conditions are favorable, it is equally as good as any terrestrial system and that it should be used when the situation will permit.

Many of our target practices have been fired with both systems of observation and from the reports of practices on file in the office of the Chief of Coast Artillery it has been possible to compare the two methods for accuracy. Maj. James B. Crawford has tabulated the results of many practices. This tabulation is reproduced here for examination by those who are interested in the relative merits of the two systems. The Chief of Coast Artillery has recently conveyed to the Chief of Air Corps his appreciation of the interest and cooperation given by Air Corps officers during seacoast artillery target practices and has expressed his satisfaction

COMPARISON BETWEEN AIR CORPS
AND
TERRESTRIAL SPOTTING

| AIR OBSERVER | BATTERY | PLACE | DATE | NO. OF S.OTS | AVERAGE ERROR (YDS) A. C. OBSERVER | AVERAGE ERROR (YDS) TER. OBSERVER | PERCENT ERROR A. C. OBSERVER | PERCENT ERROR TER. OBSERVER |
|---|---|---|---|---|---|---|---|---|
| | | | FIRST COAST ARTILLERY DISTRICT | | | | | |
| Not given | Stevens, 12" DC | Fort Warren, Mass. | October 15, 1929 | 12 | 72 | 171 | | |
| Not given | Cushing, 12" M | Fort Andrews, Mass. | October 31, 1929 | 14 | 112 | 77 | | |
| | | | SECOND COAST ARTILLERY DISTRICT | | | | | |
| NO AERIAL OBSERVATION REPORTED | | | | | | | | |
| | | | THIRD COAST ARTILLERY DISTRICT | | | | | |
| Not given | 12" M, Railway | Fort Story, Virginia | May 11, 1929 | 10 | 74 | 18 | | |
| Not given | 12" M, Railway | Fort Story, Virginia | May 17, 1929 | 7 | 68 | 35 | | |
| Not given | 12" M, Railway | Fort Story, Virginia | May 11, 1929 | 10 | only 1 reg't reported | 34 | | |
| Not given | 8" U, Railway | Fort Story, Virginia | May 11, 1929 | 1 | 63 | 103 | | |
| Not given | 8" U, Railway | Fort Story, Virginia | May 17, 1929 | 7 | 55 | 28 | | |
| | | | FOURTH COAST ARTILLERY DISTRICT | | | | | |
| I.W. Ott, 2d Lt., A.C. | Cullum, 12" DC | Fort Pickens, Florida | May 14, 1929 | 4 | 27 | 35 | | |
| I.W. Ott, 2d Lt., A.C. | Cullum, 12" DC | Fort Pickens, Florida | May 21, 1929 | 12 | 55 | 20 | | |
| | | AVERAGE ERRORS | | 16 | 13 | 21 | | |
| F. M. Paul, 1st Lt. A.C. | Sevier, 10" DC | Fort Pickens, Florida | December 3, 1929 | 12 | 43 | 31 | | |
| H. F. Gregory, 1st Lt. A.C. | Sevier, 10" DC | Fort Pickens, Florida | November 21, 1929 | 4 | 115 | 50 | | |
| | | | MIDDLE COAST ARTILLERY DISTRICT | | | | | |
| T. S. Myers, 2d Lt. A.C. | Alexander, 12" M | Fort Barry, California | April 5, 1929 | 8 | 24 | no Observation | | |
| T. S. Myers, 2d Lt. A.C. | Alexander, 12" M | Fort Barry, California | April 11, 1929 | 8 | 15 | 27 | | |
| | | | | | Lost 5 spots | | | |
| | | AVERAGE ERRORS | | 11(6) | 22 | 27 | | |
| Not given | Wallace, 12" DC | Fort Barry, California | April 5, 1929 | 4 | 43 | No Observation | | |
| Not given | Wallace, 12" DC | Fort Barry, California | April 11, 1929 | 12 | 35 | 24 | | |
| Not given | Powell, 12" M | Fort Worden, Washington | April 4, 1929 | 5 | 28 | 19 | | |
| Not given | Powell, 12" M | Fort Worden, Washington | April 11, 1929 | 10 | 46 | 84 | | |
| | | | HAWAIIAN COAST ARTILLERY DISTRICT | | | | | |
| H. E. O'Neill, Capt. A.C. | Selfridge, 12" DC | Fort Kamehameha, Hawaii | May 14, 1929 | 4 | 115 | 11 | | |
| H. E. O'Neill, Capt. A.C. | Jackson, 8" DC | Fort Kamehameha, Hawaii | March 24, 1929 (Night) | 10 | 32 | All Lost | | |
| H. E. O'Neill, Capt. A.C. | Jackson, 8" DC | Fort Kamehameha, Hawaii | April 7, 1929 | 20 | 33 | 13 | | |
| | | AVERAGE ERRORS | | 14(24) | 10 | 21 | | |
| G. G. Gressey, 1st Lt. A.C. | Selfridge, 12" DC | Fort Kamehameha, Hawaii | May 21, 1929 | 12 | 32 | 33 | | |
| G. G. Gressey, 1st Lt. A.C. | Slocum, 12" DC | Fort Kamehameha, Hawaii | May 23, 1929 | 12 | 25 | 30 | | |
| G. W. Gressey, 1st Lt. A.C. | Dudley, 8" DC | Fort Dekassey, Hawaii | April 17, 1929 | 6 | 68 | 18 | | |
| G. G. Gressey, 1st Lt. A.C. | Magruder, 14" DC | Fort Dekassey, Hawaii | April 26, 1929 | 8 | 33 | 25 | 0% | 0% |
| G. G. Gressey, 1st Lt. A.C. | 155 mm. guns | Fort Kamehameha, Hawaii | April 29, 1929 | 26 | - | - | | |
| G. G. Gressey, 1st Lt. A.C. | 155 mm. guns | Fort Kamehameha, Hawaii | April 29, 1929 | 12 | 22 | 24 | 0% | 0% |
| | | AVERAGE ERRORS | | 16 (52-26) | 35 | 28 | | |
| G. B. Leber, 1st Lt. A.C. | 155 mm. guns | Fort Kamehameha, Hawaii | April 10, 1929 | 24 | - | - | 0% | 4% |
| G. B. Leber, 1st Lt. A.C. | 155 mm. guns | Fort Kamehameha, Hawaii | April 16, 1929 | 26 | - | - | 12% | No Observation |
| G. B. Leber, 1st Lt. A.C. | 155 mm. guns | Fort Kamehameha, Hawaii | April 10, 1929 | 25 | - | - | 8% | 12%(Lost 2) |
| G. B. Leber, 1st Lt. A.C. | 155 mm. guns | Fort Kamehameha, Hawaii | April 10, 1929 | 24 | - | - | 12% | 12% |
| G. B. Leber, 1st Lt. A.C. | 155 mm. guns | Fort Kamehameha, Hawaii | April 16, 1929 | 26 | - | - | 12% | No Observation |
| | | AVERAGE ERRORS | | 123 | - | - | 10% | 7% |
| G. M. Edwards, 2d Lt. A.C. | Slocum, 12" DC | Fort Kamehameha, Hawaii | May 16, 1929 | 4 | 76 | 59 | | |
| J. F. Harley, 1st Lt. A.C. | Harlow, 12" M | Fort Ruger, Hawaii | March 12, 1929 | 8 | 42 | 16 | | |
| J. F. Harley, 1st Lt. A.C. | 12" M, Railway | Fort Kamehameha, Hawaii | March 28, 1929 | 10 | 38 | 111 | | |
| J. F. Harley, 1st Lt. A.C. | 12" M, Railway | Fort Kamehameha, Hawaii | April 8, 1929 | 14 | 43 | 13 | | |
| J. F. Harley, 1st Lt. A.C. | 12" M, Railway | Fort Kamehameha, Hawaii | March 3, 1929 | 10 | 57 | 61 | 12% | |
| J. F. Harley, 1st Lt. A.C. | 12" M, Railway | Fort Kamehameha, Hawaii | April 8, 1929 | 14 | 34 | 15 | | |
| J. F. Harley, 1st Lt. A.C. | 155 mm. guns | Fort Kamehameha, Hawaii | April 30, 1929 | 12 | 24 | 13 | 4% | 0% |
| J. F. Harley, 1st Lt. A.C. | 155 mm. guns | Fort Kamehameha, Hawaii | April 30, 1929 | 26 | - | - | 8% | 8% |
| J. F. Harley, 1st Lt. A.C. | 155 mm. guns | Fort Kamehameha, Hawaii | May 3, 1929 | 26 | - | - | 8% | 8% |
| J. F. Harley, 1st Lt. A.C. | 155 mm. guns | Fort Kamehameha, Hawaii | May 17, 1929 | 25 | - | - | | |
| J. F. Harley, 1st Lt. A.C. | 155 mm. guns | Fort Kamehameha, Hawaii | May 24, 1929 | 7 | 43 | 43 | 0% | 4% |
| J. F. Harley, 1st Lt. A.C. | 155 mm. guns | Fort Kamehameha, Hawaii | May 3, 1929 | 26 | - | - | 8% | 4% |
| J. F. Harley, 1st Lt. A.C. | 155 mm. guns | Fort Kamehameha, Hawaii | May 17, 1929 | 26 | - | - | 17% | 4% |
| J. F. Harley, 1st Lt. A.C. | 155 mm. guns | Fort Kamehameha, Hawaii | May 24, 1929 | 24 | - | - | 4% | No Observation |
| J. F. Harley, 1st Lt. A.C. | 155 mm. guns | Fort Kamehameha, Hawaii | May 3, 1929 | 26 | - | - | 8% | 12% |
| J. F. Harley, 1st Lt. A.C. | 155 mm. guns | Fort Kamehameha, Hawaii | May 17, 1929 | 26 | - | - | 12% | 4% |
| J. F. Harley, 1st Lt. A.C. | 155 mm. guns | Fort Kamehameha, Hawaii | May 24, 1929 | 26 | - | - | 8% | 7% |
| | | AVERAGE ERRORS | | 25-253 | 48 | 39 | | |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | **HARBOR DEFENSES OF MANILA - JUNE 1929** | | | | | |
| Not given | Smith, 12" MO | Fort Mills, P. I. | February 14, 1929 | 4 | 77 | 137 | | |
| Not given | Smith, 12" MO | Fort Mills, P. I. | February 21, 1929 | 11 | 60 | 72 | | |
| Not given | Wheeler, 12" MO | Fort Mills, P. I. | February 15, 1929 | 4 | 49 | 57 | | |
| Not given | Wheeler, 12" MO | Fort Mills, P. I. | March 1, 1929 | 12 | 31 | 32 | | |
| Not given | Chaney, 12" DC | Fort Mills, P. I. | February 16, 1929 | 4 | 235 | 230 | | |
| Not given | Smith, 12" MO | Fort Mills, P. I. | February 15, 1929 | 4 | 194 | 48 | | |
| Not given | Craighill, 14" M | Fort Mills, P. I. | February 19, 1929 | 8 | 23 | 26 | | |
| Not given | May, 12" M | Fort Mills, P. I. | February 22, 1929 | 8 | 23 | 25 | | |
| Not given | Geary, 12" M | Fort Mills, P. I. | February 14, 1929 | 4 | 32 | 28 | | |
| Not given | Geary, 12" M | Fort Mills, P. I. | February 14, 1929 | 4 | 84 | 28 | | |
| Not given | 155 mm. guns | Fort Mills, P. I. | January 22, 1929 | 27 | - | - | 0% | No Observation |
| Not given | 155 mm. guns | Fort Mills, P. I. | January 30, 1929 | 30 | - | - | 0% | No Observation |
| Not given | 155 mm. guns | Fort Mills, P. I. | February 18, 1929 | 30 | - | - | 0% | No Observation |
| Not given | 155 mm. guns | Fort Mills, P. I. | January 30, 1929 | 30 | - | - | 27% | 13% |
| Not given | 155 mm. guns | Fort Mills, P. I. | February 18, 1929 | 30 | - | - | 0% | 17% |
| | | | **PANAMA COAST ARTILLERY DISTRICT** | | | | | |
| J. M. Jones, 2d Lt. A.C. | Baird, 12" M | Fort Sherman, Canal Zone | October 10, 1929 | 4 | 11 | 24 | | |
| J. M. Jones, 2d Lt. A.C. | Parke, 6" DC | Fort Grant, Canal Zone | November 6, 1929 | 24 | 89 | - | | 4% |
| J. M. Jones, 2d Lt. A.C. | 14" Railway | Fort Grant, Canal Zone | November 26, 1929 | 6 | 111 | 117 | | |
| | | AVERAGE ENROLL | | 10 | 71 | 80 | | |
| G. W. Lawrence, 1st Lt. A.C. | Baird, 12" M | Fort Sherman, Canal Zone | October 30, 1929 | 8 | 76 | 20 | | |
| D. M. Cochlatter, 1st Lt. A.C. | Merritt, 12" M | Fort Grant, Canal Zone | October 24, 1929 | 6 | 50 | 67 | | |
| D. M. Cochlatter, 1st Lt. A.C. | Merritt, 12" M | Fort Grant, Canal Zone | November 14, 1929 | 10 | 12 | 18 | | |
| | | AVERAGE ENROLL | | 24 | 20 | 31 | | |
| L. C. Craigie, 1st Lt. A.C. | Parke, 6" DC | Fort Grant, Canal Zone | October 17, 1929 | 8 | 47 | 65 | | |
| L. C. Craigie, 1st Lt. A.C. | Parke, 6" DC | Fort Grant, Canal Zone | October 28, 1929 | 5 | 44 | 101 | | |
| | | AVERAGE ENROLL | | 13 | 46 | 73 | | |
| M. M. Stewart, 1st Lt. A.C. | Amern, 14" DC | Fort Grant, Canal Zone | November 19, 1929 | 4 | 14 | 33 | | |
| Not given | Mover & Stanley 14" DC | Fort Sherman, Canal Zone | November 12, 1929 | 8 | 78 | 47 | | |
| | | | **SUMMARY BY DISTRICTS BASED ON ALL FIRINGS** | | | | | |
| | | | First Coast Artillery District | 26 | 94 | - | | |
| | | | First Coast Artillery District | 75 | - | 66 | | |
| | | | Second Coast Artillery District | 20 | - | 76 | | |
| | | | Second Coast Artillery District | 20 | - | - | | 5% |
| | | | Third Coast Artillery District | 25 | 66 | - | | |
| | | | Third Coast Artillery District | 229 | - | 47 | | |
| | | | Third Coast Artillery District | 39 | - | - | | 15% |
| | | | Fourth Coast Artillery District | 32 | 55 | 30 | | |
| | | | Ninth Coast Artillery District | 48 | 36 | - | | |
| | | | Ninth Coast Artillery District | 61 | - | 47 | | |
| | | | Ninth Coast Artillery District | 40 | - | - | | 47% |
| | | | Hawaiian Coast Artillery District | 175 | 43 | - | | |
| | | | Hawaiian Coast Artillery District | 158 | - | 35 | | |
| | | | Hawaiian Coast Artillery District | 388 | - | - | 8% | |
| | | | Hawaiian Coast Artillery District | 308 | - | - | | 7% |
| | | | H. D. of Manila & Subic Bays | 63 | 45 | - | | |
| | | | H. D. of Manila & Subic Bays | 142 | - | 41 | | |
| | | | H. D. of Manila & Subic Bays | 147 | - | - | 8% | |
| | | | H. D. of Manila & Subic Bays | 168 | - | - | - | 8% |
| | | | Panama Coast Artillery District | 72 | 59 | - | | |
| | | | Panama Coast Artillery District | 75 | - | 48 | | |
| | | | Panama Coast Artillery District | 54 | - | - | | 1% |
| | | | **SUMMARY OF ALL COAST ARTILLERY** | | | | | |
| | | | Coast Artillery Corps | 448 | 53 | - | | |
| | | | Coast Artillery Corps | 789 | - | 45 | | |
| | | | Coast Artillery Corps | 535 | - | - | 7% | |
| | | | Coast Artillery Corps | 659 | - | - | - | 9% |

with the excellent work of the aerial observers. The preceding chart presents an excellent basis for analysis and is so well prepared that it needs no explanation.

## Training Schedules

This is a dry subject. Perhaps we shouldn't have attempted it. But it was suggested by an article by Capt. Andrew H. Harriss, Jr., Adjutant of the 252nd Coast Artillery (NC. NG.) which appears in an early number of the JOURNAL and it is a subject which deserves some consideration by Regular officers of Coast Artillery.

Not so many years ago training schedules were not used. We say this advisedly. Some time before the war if you were a new second lieutenant your battery commander was apt to be a grizzled veteran of the Spanish-American War who had been a battery commander since 1901. They had been battery commanders so long that they didn't *need* a training schedule. Perhaps they had them but we can't recall that they bothered to show them to new, green second lieutenants who wouldn't have known what they were anyway. Perhaps we are wrong but there seemed to be lots of individuality in a battery's training in those days. One battery commander would be very strong for small arms firing so he would spend much time on that. Another would be such a strong booster of the "Queen of Battles" that he would spend hours and hours on infantry drill. And if your battery commander had just returned from Leavenworth you could be sure that the "company" would become by the help of his excellent imagination a division or even an army corps defending against a landing in force at some point nearby which for the moment it pleased him to consider important. Sometimes much instruction was obtained through the individual qualifications of the battery commanders of those days.

Then came the war. To be rather blunt, the battery commanders of war times, at first, didn't know what it was all about and the training schedule came into its own. But after the war individuality began to make its appearance again and battery commanders were inclined to try out their own ideas as to what instruction should be given their battery. But they weren't allowed to get away with this. The War Department, the Corps Area, and commanding officers all the way down insisted that a schedule or program should be submitted to higher headquarters for approval.

It is amusing to recall some of the subterfuges used to escape the schedule. Some battery commanders would be dilatory in getting it in, hoping that, we suppose, that the regimental plans and training officer would finally be worn down and cease to call for it. Others would submit it but made no attempt to follow it. Just went serenely ahead with their own ideas as to how the training should be given. There was much argument that "you can't work on a schedule," that an inspection by "rank" "threw the schedule all out," that rain and inclement weather caused ir-

regularities. The answer to all these arguments is that if the schedule won't work then it isn't a good schedule and more effort should be expended on formulating a workable one.

To anticipate and plan ahead is one of the principal duties of the commander of any organization. It is very necessary that a battery commander should plan his work ahead so that he has a clear idea of what he is going to do. If he is compelled to submit a schedule for approval he *must* plan his battery training in advance, otherwise he will not know what to put in the schedule. The schedule compels him to be forehanded and anticipate the important periods in the year's training, such as target practice, etc. Each phase of training should and does culminate in a definite objective. In gunners' instruction it is the examination. In small arms it is record practice. With mobile units it is the annual road march. A certain fixed period of time is allotted for each kind of training. It should be progressive. And suballotments should be made in accordance with the importance of each phase coming under that particular subject. How can this progress and proportional allotment be made unless the battery commander's solution is submitted in the form of a schedule?

But schedules are useful to the higher commanders, too. The higher commander may be a regimental commander and as such he is responsible for the training of his battalions (batteries). He cannot properly inspect the training given in the batteries unless it is uniform, unless he has a clear idea of what training is being given and by constant contact can keep informed of its progress. For the commander not in contact with the troops it is even more difficult and unsatisfactory.

There is a still more important consideration in the use of training schedules and that is the men themselves. Some of our artillery drill used to be "dumb" (as it would be said nowadays). To the men in the observing stations, the B. C. station, or perhaps the gun pointer, it might not appear so bad. But what of the men shoving a shot truck or sweating over a monotonous job in the plotting room. All of us can recall hot days in a mortar pit when an egg could be fried on the concrete, or when the sweat ran down the arm setters' noses and dripped on the plotting board. Some of us can recall entire mornings given over to "home ram"—a useful but highly monotonous and laborious operation. If the battery schedule is properly planned every effort will be made to vary the drill and training so that the monotonous drills are short and interspersed with others that are different and less monotonous.

Battery commanders who have been most successful have had marked ability in accomplishing team work. The greatest factor in developing team work is interest. In the Coast Artillery many of our men perform only small operations which contribute to the successful operation of the battery. It is easy for a man under such conditions to imagine that he is only a cog in a machine and to exhibit about as much interest in the work

of the machine as the cog does. Instead, he should consider himself a member of a team. In other words, his interest must be captured and held. If this can be done then he will be on his toes, mentally alert and anxious to give his fullest attention and cooperation in the business at hand.

The imaginative battery commander will accomplish this result. But he must have a clear understanding and carefully thought out plan of the instruction to be given. This, when reduced to paper, is nothing more than the battery training schedule for the week.

## Japanese Antiaircraft

Our Japanese correspondent, 1st Lieut. E. Carl Engelhart, C. A. C., now serving a "language" detail in Japan, sends the JOURNAL interesting bits of information from time to time. Lieutenant Engelhart was present as an observer during the Japanese Grand Maneuvers which were held last November. He will be detailed with a Japanese antiaicraft regiment for a period of six months, beginning in June.

In this connection it is interesting to note that there is but one Japanese antiaircraft regiment. This regiment has two battalions of two batteries each and is equipped with eight searchlights, similar to our Cadillac unit and provided with the exponential type of sound locator. Each battery has three platoons. One platoon mans 105-mm. guns and the other two platoons man 75-mm. guns. Each platoon has two guns and two machine guns.

The general characteristics of the two guns are as follows:

| | *75-mm. gun* | *105-mm. gun* |
|---|---|---|
| Muzzle velocity | 1836 f/s | 3000 f/s |
| Maximum elevation | 85 degrees | 85 degrees |
| Traverse | 360 degrees | 360 degrees |
| Maximum horizontal range | 10,900 yds. | 17,500 yds. |
| Maximum vertical range | 6,550 yds. | 13,100 yds. |
| Rate of fire | 20 rounds per min. | 15 rounds per min. |

Both guns are mounted on two-wheeled trailers, the two wheels and axle being removed when emplaced.

We expect Lieutenant Engelhart to produce an interesting article for the JOURNAL in connection with his tour with the Japanese antiaircraft regiment.

## Signal Corps Develops New Type of Field Wire for the Army

After a number of years of study and experiment, the Signal Corps technical staff has recently completed the design, development and preliminary test of a new type of wire for portable field use that, it is hoped, will take the place of both the heavy and light types now issued and provide a better all around wire for field telephone and telegraph communication.

The Signal Corps supplies wire of different types to the Army for communication purposes. That supplied to the combat branches for laying quickly on the ground to provide communication within the division is, at present, of two types; a heavy insulated wire laid from horse or motor-drawn vehicles and a lighter insulated wire laid by hand or from hand-drawn vehicles.

The new type of wire (called field wire, type W-110) possesses high tensile strength and insulation, light weight and flexibility and when lying flat on the ground will successfully withstand considerable abrasion caused by passing vehicles, trampling by horses or men, or other abuse. Because of its lighter weight and decreased volume per mile, relatively larger amounts of the new type of wire can be transported and put on reels than was possible with the old type of heavy field wire. This new wire is generally considered to be a valuable improvement in the Signal equipment of the Army, and the Secretary of War has approved the purchase of a quantity of it that will permit extended field tests pending adoption as a standard of issue to the service.

## New Tow Target Release Mechanisms Tested

In order that tow targets, after having been fired upon, may be dropped from planes and fresh ones substituted without rewinding the cable and manually attaching them, two new types of release mechanism have been designed for use with the standard B-9A target. One type was designed at Phillips Field, Md., and the other at Wright Field, Dayton, Ohio. Preliminary tests have been run on each, but decision has not yet been made as to the one which will prove superior for adoption.

The old mechanism had a release catch on the end of the cable. When it was desired to drop the target, a bell plunger was sent down the cable which unsnapped the catch. The new devices have no releases on the end of the cable. In the Phillips Field design, a plunger backs up against a knot tied in the cable. When the other plunger comes down with a fresh target and makes contact, it forces the first one open and the target drops. In one test, ten tow targets were successfully exchanged in flight with apparent ease of operation.

The Materiel Division design consists of a steel bar with a latch at one end and a trip on the other. As the new target comes down the cable a ring is forced over the trip, depressing it. This action lifts the latch at the other end, releasing the old target. Upon release of the old target the latch springs back, acting as a catch for the new target. By releasing the target as each arm completes firing, the percentage of successful hits of each may be learned.

—*From the Air Corps News Letter.*

# COAST ARTILLERY BOARD NOTES

*Communications relating to the development or improvement in methods or materiel for the Coast Artillery will be welcome from any member of the Corps or of the Service at Large. These communications, with models or drawings of devices proposed, may be sent direct to the Coast Artillery Board, Fort Monroe, Virginia, and will receive careful consideration. J. C. Ohnstad, Lieutenant Colonel, C. A. C., President.*

**Project No. 563/B—Modified Stereoscope Lorgnette, M1926.**—Completed March 31. Believed would be satisfactory with suggested modifications.

**Project No. 763—Cinematic Spotting Instrument, T-3.**—Completed March 4. Antiaircraft test completed and preliminary report submitted. Recommended for adoption as standard and issue to service.

**Project No. 765—Design for Central Station Computor for Heavy Gun Batteries.**—Completed March 26. Recommended no development pending test of Sperry S. C. Computor.

**Project No. 768—Comments on Provisional TR 435-440; Combined Training of Coast Artillery and Air Corps.**—Completed March 4. Comments submitted.

**Project No. 770—Zeiss 4-meter Stereoscopic Height Finder, T-7.**—Completed March 4. Recommended adoption as standard and issue to service.

**Project No. 774—Shoulder Stock for Caliber .50, AA MG Mount M-1.**—Completed March 4. Recommended modification be applied on tripod to be purchased for issue to Regular Army and National Guard.

**Project No. 775—Comments on Technical Regulations 1305-155C, and 1405-155C.**—Completed March 6. Comments submitted.

**Project No. 779.—Comments on Technical Regulations 1365-12A, Ammunition for 12-inch Guns, M1888-95 and 1900.**—Completed March 17. Comments submitted.

## PROJECTS UNDER CONSIDERATION

**Project No. 609—Comparative Test of Self-contained Range Finders.**—Expect to hold test in April or May.

**Project No. 681—Test of Fast Towing Target (Navy Design).**—Awaiting result of study by Navy Department.

**Project No. 689—Special Seacoast Target Practice for Training of Aerial Observers.**—Awaiting reports of practices.

**Project No. 694—Test of Erosion Charts.**—Final firings in Spring, 1930.

**Project No. 700—Test of Stereoscopic Trainer, T1.**—Test nearly completed. Report will be submitted about May 31.

**Project No. 701—Comments on Target Practice Reports, 1929.**—Comments are submitted as reports are received.

**Project No. 712—Conduct and Adjustment of AA Fire.**—Draft of bulletin prepared.

**Project No. 722—Two Chains for Tractor Artillery (C. A. B.).**—Under test by 51st C. A.

**Project No. 723—Study of the Causes of Misfires (C. A. B.).**—Under study.

**Project No. 726.—Dummy Projectile for 3-inch AA (C. A. B.).**—Test completed. Report in preparation.

**Project No. 727.—Standard Single Conductor Mine System.**—A continuing study.

**Project No. 731—Lighting Devices for Panoramic Sights, Scales, and Aiming Rules, Ry. Arty. (C. A. B.).**—Devices installed and tested. Undergoing further study and test.

**Project No. 743—Service Test of Ordnance Tractor, Caterpillar "20."**—Test completed. Report will be submitted about May 1.

**Project No. 750—Faster Loading for Coast Artillery (C. A. B.).**—Under study.

**Project No. 752.—"Stephens" Xylonite Plotter for AA Target Practice.**—Awaiting reports from testing organizations.

**Project No. 753—Test of 8-inch Howitzer Firing Platforms for Use as Semi-permanent Firing Position for 155-mm. Guns.**—Under study.

**Project No. 758—Comments on Basic Field Manual, Transport, Vol. V.**—Under study.

**Project No. 761—Test of Experimental Reel Cart, Type RL-23.**—Test by 61st C. A. completed. Undergoing test by 51st C. A.

**Project No. 764—Reminder List for AA Target Practice.**—Under study.

**Project No. 769—Gasoline Tank Truck (three hundred-gallon) for AA.**—Report in preparation.

**Project No. 772—Test of Motor Vehicles as Prime Movers and Cargo Trucks, AA.**—Test completed. Report delayed pending receipt of report of dynomometer tests conducted at Aberdeen Proving Ground.

**Project No. 776—Supplementary Instructions, and Ammunition Allowances for Target Practice Year 1930-31.**—Awaiting instructions reference change in ammunition allowances.

**Project No. 777—Continuous Graphic Method of Adjustment of Fire.**—Under study.

**Project No. 778—Comments on Technical Regulations No. 1370-D Drill Ammunition.**—Under study.

**Project No. 780—Gages for Seacoast and Railway Artillery Propelling Charges.**—Under test.

# YOU TELL EM

Recently the Editor received a rather critical letter which belongs in this column but due to the wishes of the writer it will not be published. Although we have received a considerable number of letters in praise of the JOURNAL we have received none so unfavorable as this one. We would have been pleased to publish this one because we never intended to apply any censorship to this column. Furthermore, his letter contains some points well worth mentioning.

He frankly tells us that he is subscribing (Yes, he subscribed, although he hasn't been a subscriber for over two years) because he thinks the JOURNAL should be supported. This spirit is appreciated.

He further states that the Editor is up against an impossible job—impossible because there is not enough of importance to publish in a monthly publication. He recommends an interval of two or three months between issues. On this point we beg to differ with him. The Editor's job is not impossible and there is plenty of material—at least in the minds of the officers of the Corps. There is plenty of material in foreign periodicals which are not generally read by our officers because they don't feel financially able to subscribe to them for the sake of reading an occasional article of interest. The COAST ARTILLERY JOURNAL *could* be issued monthly simply as a digest of these periodicals. We have purposely kept the number of reprinted articles low because we believed that one of the important missions of the JOURNAL is to inform our officers of what our own Coast Artillery Corps is doing.

One part of his letter expresses his unfavorable opinion of this column. In particular he dislikes criticisms of former editors. The present Editor agrees with him in regard to criticism of the former editors. We take it that such criticism, when expressed, is not a personal one but intended to express disapproval of the rather somber and gloomy form which the JOURNAL formerly assumed. This is a criticism which can be applied to all strictly technical magazines regardless of whom the editor may be. It is our conception that serious-mindedness can be carried to excess, that gloominess is not necessary to the dissemination of information. At the same time we are convinced that the former JOURNAL had more of real value in its pages—more real meat—than the present one. But our aim is to *get it read* and to accomplish this we have to use some bait. We admit of an effort at finesse in this and tell you frankly that you are being fooled but we can't stare a growing subscription list in the face and admit that it is a mistake.

The development of esprit is one of the most important objectives which the JOURNAL has. One may search through all the text books (if

there are any) and find various methods recommended for accomplishing this. Nearly all depend upon the development of team work. Many times the criticism has been made that the Coast Artillery Corps is lacking in esprit. This is not a general opinion and our personal opinion is that it is unmerited. The JOURNAL intends to combat any indication of such a feeling. When the accomplishments of the Coast Artillery are reviewed there are no proper grounds for such pessimism. The Chief of Coast Artillery is interested in fostering a closer relationship between his office and the officers of the Corps. He wishes them to know his policies and, so far as practicable, the difficulties which confront the fullest development of the Coast Artillery Corps as one of the combat arms. He wishes a feeling of mutual understanding and effort to exist. The JOURNAL will do its part in fostering this spirit by making known his thoughts and plans for increasing the efficiency of the Coast Artillery. On the other hand the thoughts and opinions of the various individuals in the Corps are not to be submerged but are to be given expression in the pages of the JOURNAL. Honest expression of opinion is never harmful and develops an initiative which is a gratifying indication of progress.

The *You Tell Em* column, it was hoped, would furnish the opportunity to blow off steam and tell the world where the "system" was all wrong. On the golf course it is called "locker room talk." In the day room, soldiers take it out on the mess sergeant. In the officers' club there is always some Moses who knows that it is all wrong and can put it right. We wished to give these prophets a chance to make themselves heard. They may appear anonymously or otherwise (Remarkable how many of them wish to be anonymous). Here they are perfectly free to take a crack at the JOURNAL or to indicate where our present artillery methods are not making the grade. We would have been pleased to include our correspondent's letter in this column, because then we could have found out how much other readers agree with him. It would have done him good, too, for it relieves the pressure to get certain opinions off the chest. Unfortunately many of them do not seem to have the potency expected when they appear in print. Snipers are always shooting them full of holes.

Our subscriber's letter is appreciated not only for its unfavorable contents. He inclosed with it a short article and mentions others which he has in mind. This is real support. The Editor can make use of this kind.

(Aside) What is worrying us is his statement that he subscribed out of a sense of duty, only. He hasn't been a subscriber since 1927 and he didn't support it for a year and a half before we came on the job with our tabloid methods. Maybe he likes it, after all. Just to take the curse off we'll throw in the one below in which

### A Lieutenant Makes Wonderful Discovery

The Editor, the COAST ARTILLERY JOURNAL
Dear Sir:

I received the March issue of the COAST ARTILLERY JOURNAL and was more than pleased with what I found within its covers. Had I realized what it contained I would probably have signed up long before I did.

More *power* to you, Major.

Sincerely yours,

CHARLES H. GAIGE,
*2nd Lieut., CA-Res.*

### It Won't

The Editor, the COAST ARTILLERY JOURNAL
Dear Sir:

I am tired of waiting for that raise in pay—one can hold out against temptation just so long and no longer. We will probably have to go without a few meals to make up for this, but you will have to send Mrs. Pohl *The Saturday Evening Post* for the coming year beginning April 19, and send me the COAST ARTILLERY JOURNAL for a like period beginning with the May issue. I have two dollars with which to pay for the *Post* and am inclosing same, but you'll have to bill me for the JOURNAL and hope the pay bill goes through before the bill gets to me.

M. G. POHL,
*2nd Lieut., 64th C. A.*

### Now We'll Have to Read It

THE MACAULAY COMPANY
New York

The Editor, the COAST ARTILLERY JOURNAL
Dear Sir:

Thank you very much for sending us a copy of the COAST ARTILLERY JOURNAL containing the review of "My First 2000 Years." It is very interestingly handled and we are very pleased with it.

Sincerely yours,

ESTELLE HELLE,
*The Macaulay Company.*

New York.

The Editor, the COAST ARTILLERY JOURNAL
Dear Sir:

Will you be good enough to send me two copies of your issue which contains the excellent review of my book, "My First Two Thousand Years," signed G. B. R.?

Sincerely yours,

GEORGE S. VIERICK.

NOTE: G. B. R. refers to Maj. G. B. Robison.

## For Sale

A correspondent sends us a copy of an ad said to have been inserted in a Baltimore paper by 1st Lieut. Horace Speed, Jr.

ANTIQUES

For sale. Marvelous example of early American Cadillac. A veritable museum piece. While documentary evidence is lacking, there is a well-found tradition that General Washington slept on it. Collectors of America will be particularly interested in the sun vizor decoration, thought to represent ice floes in a river. Must be seen to be appreciated.

This unnumbered article runs as well at (or with) a high speed (5′ 11″, Horace) as a low speed (5′ 3″, Minette). Its mechanical simplicity is such that it can be overhauled by an eight-year-old girl (on roller skates).

Must be sacrificed because of foreign service. No reasonable offer refused. Bids of less than one dollar will be rejected.

Apply: "Speed King," R. F. D. III
(Aberdeen (P. G.))

## Maneuvers

(Corregidor, P. I.—1924)

*By* TENEYCK VAN DEUSEN

The Stygian dark is stabbed with swords
Of silver flaming light.
The grey guns couched, arise to speak,
Shatt'ring the silent night.
With blood red tongues of living flame
They searched the rippling sea
Where lifting, hissing, passed the ships—
The ships we could not see.
The servants of the great grey guns
In sleepless patience wait
Until the warders of the lights
Align their beams full straight
On grey ghosts coursing through the waves
To force the seaward gate.

# COAST ARTILLERY ORDERS

Brig. Gen. William E. Cole, from command 30th Brig., Fort Eustis, to command 1st C. A. District, Boston.

Col. John W. Gulick, appointed Chief of Coast Artillery.

Col. William H. Monroe, from Philippines, to 9th, Fort Preble.

Col. Archibald H. Sunderland, from 14th, Fort Worden, to General Staff and to Hawaii, sailing San Francisco, July 9.

Lieut. Col. Malcolm P. Andruss, to sail for Panama from New York, August 7, instead of June 12.

Lieut. Col. Francis J. Behr, from 8th, Fort Preble, to duty with Porto Rican Hurricane Relief Commission, San Juan, P. R., sailing New York, April 18.

Lieut. Col. William T. Carpenter, from instructor, C. and G. S. School, Fort Leavenworth, to 62nd, Fort Totten, at end of school year.

Lieut. Col. Clifford Jones, from student, Naval War College, Newport, R. I., to General Staff and to Philippines, sailing New York, August 20.

Lieut. Col. William M. Colvin, from Org. Res., Schenectady, New York, to Org. Res., New York City.

Lieut. Col. William A. Covington, from Hawaii, to 6th, Fort Winfield Scott.

Lieut. Col. Jacob A. Mack, from 3rd, Fort Rosecrans, to home and await retirement, July 5; previous orders from Fort Rosecrans to Philippines revoked.

Lieut. Col. Lloyd B. Magruder, from 62nd, Fort Totten, to student, War College, August 14.

Lieut. Col. John R. Musgrave, from Org. Res., Cincinnati, to Hawaii, sailing New York, June 18.

Lieut. Col. Charles H. Patterson, from detail in Insp. Gen. Dept., and from Philippines to 52nd, Fort Hancock.

Lieut. Col. Richard H. Williams, from detail on General Staff and Washington, June 30, to Hawaii, sailing New York, September 27.

Lieut. Col. Philip H. Worcester, from General Staff and Washington, to Philippines, sailing New York, October 28.

Maj. Herbert H. Acheson, from 55th, Fort Kamehameha, to student, War College, August 14.

Maj. E. E. Bennett, from Org. Res., headquarters, 3rd C. A. District, Fort Monroe, to Philippines, sailing New York, August 20.

Maj. Robert D. Brown, from R. O. T. C., University of California, Berkeley, to duty in office, Chief of Staff, Washington, sailing San Francisco, June 25.

Maj. Gordon deL. Carrington, from Hawaii, to 6th, Fort Winfield Scott; from 6th, Fort Winfield Scott, to student, C. and G. S. School, Fort Leavenworth, August 20.

Maj. Willis McD. Chapin, from student, C. A. S., Fort Monroe, to Panama, sailing New York, August 7.

Maj. William P. Cherrington, from student, C. and G. S. School, Fort Leavenworth, to R. O. T. C., V. P. I., Blacksburg, Va., at end of present course.

Maj. Albert D. Chipman, from student, C. A. S., Fort Monroe, to 13th, Fort Barrancas, upon completion of present course.

Maj. Donald M. Cole, from student, C. A. S., Fort Monroe, to Hawaii, sailing New York, August 12.

Maj. Clarence E. Cotter, from student C. and G. S. School, Fort Leavenworth, to Coast Artillery Board, Fort Monroe, upon completion of present course.

Maj. Joseph F. Cottrell, from 6th, Fort Winfield Scott, to pilgrimage of War Mothers, reporting New York, April 15.

Maj. Raymond V. Cramer, from Hawaii, to office, Chief of Coast Artillery, Washington.

Maj. Carl S. Doney, from instructor, N. G., San Francisco, to student, C. A. S., Fort Monroe, August 30.

Maj. Richard Donovan, from 4th C. A. District Staff, Fort McPherson, to student, War College, August 14.

Maj. Frank Drake, from Panama, to student, C. and G. S. School, Fort Leavenworth, August 20.

Maj. Ward E. Duvall, from headquarters, Fourth Corps Area, Fort McPherson, to student, C. and G. S. School, Fort Leavenworth, August 20.

Maj. George W. Easterday, from 91st, Fort Mills, to student, War College, August 14.

Maj. William S. Fulton, from Hawaii, to Org. Res., Houston, Texas.

Maj. Ferdinand P. Gallagher, from student, C. A. S., Fort Monroe, to headquarters, 1st C. A. District, Boston, upon completion of present course.

Maj. Robert C. Garrett, from Philippines, to 6th, Fort Winfield Scott.

Maj. Richmond T. Gibson, from student, C. and G. S. School, Fort Leavenworth, to 13th, Fort Moultrie, upon completion of present course.

Maj. William C. Hanna, from student, C. A. S., Fort Monroe, to 14th, Fort Worden, upon completion of present course.

Maj. Francis A. Hause, from student, C. & G. S. School, Fort Leavenworth, to Org. Res., Pittsburgh, Pa., upon completion of present course.

Maj. Henry B. Holmes, Jr., from student, C. and G. S. School, Fort Leavenworth, to Philippines, sailing San Francisco, September 10.

Maj. John H. Hood, from 3rd, Fort MacArthur, to student, C. and G. S. School, Fort Leavenworth, August 20.

Maj. Frank L. Hoskins, from student, C. and G. S. School, Fort Leavenworth, to Hawaii, sailing San Francisco, August 9.

Maj. George F. Humbert, from student, Graduate School of Business Administration, Harvard University, Cambridge, Mass., to Org. Res., Lansing, Mich., after refresher course at Fort Monroe beginning March 15.

Maj. Thomas H. Jones, from instructor, C. A. S., Fort Monroe, to student, War College, August 14.

Maj. Edward L. Kelly, from West Point, to 7th, Fort Hancock.

Maj. Delmar S. Lenzner, from student, C. A. S., Fort Monroe, to 51st, Fort Monroe, upon completion of present course.

Maj. James D. MacMullen, from Fort Monroe, to instructor, N. G., San Francisco, Cal., sailing New York, July 18.

Maj. John B. Martin, from student, C. A. S., Fort Monroe, to headquarters, 3rd C. A. District, Fort Monroe, upon completion of present course.

Maj. Kenneth McCatty, from student, C. A. S., Fort Monroe, to Panama, sailing New York, August 7.

Maj. Edwin C. Mead, from 13th, Fort Moultrie, to student, C. and G. S. School, Fort Leavenworth, August 20.

Maj. Reinold Melberg, from student, C. A. S., Fort Monroe, to 14th, Fort Worden, sailing New York, August 12.

Maj. Earl H. Metzger, from student, A. C. T. S., Langley Field, to headquarters, 3rd C. A. District, Fort Monroe, upon completion of present course.

Maj. Frederick A. Mountford, from instructor, C. A. S., Fort Monroe, to student, War College, August 14.

Maj. Martin J. O'Brien, from R. O. T. C., Utah State Agricultural College, Logan, to student, C. A. S., Fort Monroe, sailing San Francisco, July 30.

Maj. Charles D. Y. Ostrom, from student, C. A. S., Fort Monroe, to 12th, Fort Monroe, upon completion of present course.

Maj. Robert E. Phillips, from Philippines, to 11th, Fort H. G. Wright.

Maj. Edward W. Putney, from temporary duty, office Chief of Coast Artillery, to student, War College, August 14.

Maj. James C. Ruddell, from Coast Artillery Board, Fort Monroe, to student, C. and G. S. School, Fort Leavenworth, August 20.

Maj. Jesse L. Sinclair, from General Staff, Washington, June 30, and to Panama, sailing New York, September 11.

Maj. Carl J. Smith, from student, C. and G. S. School, Fort Leavenworth, to Hawaii, sailing San Francisco, July 9.

Maj. John P. Smith, from instructor, C. and G. S. School, Fort Leavenworth, to 10th, Fort Adams, at end of present school year.

Maj. John S. Smylie, from student, C. and G. S. School, Fort Leavenworth, to Philippines, sailing San Francisco, September 10.

Maj. Edward A. Stockton, Jr., from 59th, Fort Mills, to student, War College, August 14.

Maj. Edgar H. Underwood, from Hawaii, to student, C. A. S., Fort Monroe, August 30.

Maj. Eugene Villaret, from Q. M. C., Subsistence School, Chicago, to student, Ecole de Guerre, Paris, France, sailing New York, June 18.

Maj. Berthold Vogel, from student, C. A. S., Fort Monroe, to Hawaii, sailing New York, August 12.

Maj. Lawrence B. Weeks, from student, C. and G. S. School, Fort Leavenworth, to 62nd, Fort Totten, upon completion of present course.

Maj. Gordon B. Welch, Frankford Arsenal, transferred to Ordnance Dept., March 19.

Maj. Edward N. Woodbury, from 7th, Fort Hancock, to student, War College, August 14.

Capt. Carl R. Adams, from student, Battery Course, C. A. S., to student, Advanced Course, C. A. S., Fort Monroe, August 30.

Capt. Clare H. Armstrong, from student, C. A. S., Fort Monroe, to Philippines, sailing New York, August 20.

Capt. Harold G. Archibald, from 14th, Fort Casey, to student, Battery Course, C. A. S., Fort Monroe, August 30.

Capt. Elvin L. Barr, from student, C. A. S., Fort Monroe, to Philippines, sailing New York, August 20.

Capt. Roy T. Barrett, to sail for Hawaii, from San Francisco, September 3, instead of from New York, July 18, as previously ordered.

Capt. Ernest R. Barrows, from 10th, Fort Adams, to student, C. A. S., Fort Monroe, August 30.

Capt. Thomas R. Bartlett, from student, Battery Course, C. A. S., to student, Advanced Course, C. A. S., Fort Monroe, August 30.

Capt. Adam J. Bennett, from 7th, Fort Hancock, to 52nd, Fort Hancock.

Capt. Coburn L. Berry, from 7th, Fort Hancock, to 52nd, Fort Hancock.

Capt. Ben B. Blair, from 12th, Fort Monroe, to Panama, sailing New York, August 7.

Capt. George Blaney, from 9th, Fort Banks, to student, C. A. S., Fort Monroe, August 30.

Capt. Harold B. Bliss, from student, C. A. S., Fort Monroe, to Panama, sailing New York, August 7.

Capt. Louis J. Bowler, from Philippines, to student, C. A. S., Fort Monroe, August 30.

Capt. William C. Braly, from student, C. A. S., Fort Monroe, to 12th, Fort Monroe, upon completion of present course.

Capt. William J. Burke, from student, C. A. S., Fort Monroe, to R. O. T. C., University of Kansas, Lawrence, upon completion of present course.

Capt. Alexander H. Campbell, from student, C. A. S., Fort Monroe, to R. O. T. C., University of California, Berkeley, sailing New York, June 18.

Capt. William R. Carlson, from student, C. A. S., Fort Monroe, to Hawaii, sailing New York, August 12.

Capt. Albert C. Chesledon, from 3rd, Fort MacArthur, to student, C. A. S., Fort Monroe, sailing San Francisco, July 30.

Capt. Francis L. Christian, from Hawaii, to 52nd, Fort Monroe.

Capt. Willis L. Claxton, from R. O. T. C., University of Cincinnati, to Panama, sailing New York, August 7.

Capt. Eugene T. Conway, from student, Battery Course, C. A. S., to student, Advanced Gunnery Course, C. A. S., Fort Monroe, August 30.

Capt. Frederick W. Cook, from Philippines, to 7th, Fort DuPont.

Capt. James L. Craig, from Panama, to 13th, Fort Barrancas.

Capt. Leonard L. Davis, from student, Battery Course, C. A. S., to student, Advanced Gunnery Course, C. A. S., Fort Monroe, August 30.

Capt. John T. deCamp, from Hawaii, to 12th, Fort Monroe, from 12th, Fort Monroe, to student, Battery Course, C. A. S., Fort Monroe, August 30.

Capt. Nelson Dingley, 3rd, from student, C. A. S., Fort Monroe, to Philippines, sailing New York, August 20.

Capt. George W. Dunn, Jr., from Panama, to 7th, Fort Hancock.

Capt. William D. Evans, from student, C. A. S., Fort Monroe, to Philippines, sailing New York, August 20.

Capt. Valentine P. Foster, from instructor, N. G., Boston, to student, Fort Monroe, August 30.

Capt. Russell T. George, from Hawaii, to 12th, Fort Monroe; from 12th, Fort Monroe, to student, Advanced Course, C. A. S., Fort Monroe, August 30.

Capt. Chauncey A. Gillette, from student, C. A. S., Fort Monroe, to 63rd, Fort MacArthur, upon completion of present course.

Capt. Henry F. Grimm, from Philippines, to student, C. and G. S. School, Fort Leavenworth, August 20.

Capt. Vernon W. Hall, from R. O. T. C., Mass. Inst. Tech., Cambridge, to student, C. and G. S. School, Fort Leavenworth, August 20.

Capt. Philip W. Hardie, from R. O. T. C., Michigan State College, East Lansing, to 13th, Fort Barrancas, upon completion of present school year.

Capt. Norman E. Hartman, from student, Battery Course, C. A. S., to student, Advanced Motor Transport Course, C. A. S., Fort Monroe, August 30.

Capt. William Hesketh, from 12th, Fort Monroe, to pilgrimage of War Mothers, reporting New York, April 15.

Capt. Frank A. Hollingshead, from student, Battery Course, C. A. S., to student, Advanced Engineering Course, C. A. S., Fort Monroe, August 30.

Capt. Byron T. Ipock, from Philippines, to 12th, Fort Monroe, instead of to 9th, Fort Banks, as previously ordered; from 12th, Fort Monroe, to student, Advanced Course, C. A. S., Fort Monroe, August 30.

Capt. Leslie W. Jefferson, now at Fitzsimmons Hospital, from 6th, Fort Winfield Scott, to recruiting, Fort Logan, Col.

Capt. Parry W. Lewis, from student, Battery Course, C. A. S., to student, Advanced Motor Transport Course, C. A. S., Fort Monroe, August 30.

Capt. Frederick Lofquist, from 11th, Fort H. G. Wright, to student, C. A. S., Fort Monroe, August 30.

Capt. Percy S. Lowe, from student, C. A. S., Fort Monroe, to Hawaii, sailing New York, July 18.

Capt. LeRoy Lutes, from student, C. and G. S. School, Fort Leavenworth, to Fort Totten upon completion of course.

Capt. William R. Maris, from 7th, Fort DuPont, to student, C. A. S., Fort Monroe, August 30.

Capt. Otta Marshall, from recruiting, New York, to 13th, Fort Barrancas, June 1.

Capt. Edward B. McCarthy, from student, C. A. S., Fort Monroe, to 9th, Fort Banks, upon completion of present course.

Capt. Bryan L. Milburn, from 12th, Fort Monroe, to student, Advanced Course, C. A. S., Fort Monroe, August 30.

Capt. Lawrence C. Mitchell, from 52nd, Fort Eustis, to Paris with pilgrimage of War Mothers, sailing New York, April 16.

Capt. Marvel H. Parsons, from Fort Monroe, to West Point, July 1.

Capt. Harry E. Pendleton, from student, Battery Course, to student, Advanced Motor Transport Course, C. A. S., Fort Monroe, August 30.

Capt. Frank Richards, from student, C. A. S., Fort Monroe, to 61st, Fort Sheridan, upon completion of present course.

Capt. Kenneth Rowntree, from student, C. A. S., Fort Monroe, to Philippines, sailing New York, August 20.

Capt. Paul W. Rutledge, from R. O. T. C., University of Alabama, to Philippines, sailing New York, August 20.

Capt. William Sackville, from 69th, Aberdeen Proving Ground, to student, C. and G. S. School, Fort Leavenworth, August 20.

Capt. John L. Scott, from R. O. T. C., V. P. I., Blacksburg, Va., to student, C. and G. S. School, Fort Leavenworth, August 20.

Capt. Evan C. Seaman, from Philippines, to student, C. and G. S. School, Fort Leavenworth, August 20.

Capt. Edward C. Seeds, from student, C. A. S., Fort Monroe, to Panama, sailing New York, September 11.

Capt. Adrin B. Smith, from 6th, Fort Winfield Scott, to student, C. A. S., Fort Monroe, sailing San Francisco, July 30.

Capt. Lessley E. Spencer, from 62nd, Fort Totten, to student, C. A. S., Fort Monroe, August 30.

Capt. Joseph C. Stephens, from instructor, N. G., Monett, Mo., to student, Advanced Course, C. A. S., Fort Monroe, August 30.

Capt. Wilfred H. Steward, from student, C. A. S., Fort Monroe, to 14th, Fort Worden, upon completion of present course.

Capt. Edmund H. Stillman, from R. O. T. C., University of California, Berkeley, to student, C. A. S., Fort Monroe, sailing San Francisco, July 30.

Capt. Frederick L. Topping, from Panama, to student, C. A. S., Fort Monroe, August 30.

Capt. James R. Townsend, from student, Battery Course, C. A. S., to student, Advanced Course, C. A. S., Fort Monroe, August 30.

Capt. Lynn P. Vane, 8th, Fort Preble, to Panama, sailing New York, August 7.

Capt. George W. Whybark, from student, C. A. S., Fort Monroe, to Philippines, sailing New York, August 20.

Capt. Arthur V. Winton, from instructor, C. A. S., to student, Advanced Course, C. A. S., Fort Monroe, August 30.

1st Lieut. Edward Barber, from student, Battery Course, C. A. S., to student, Advanced Engineering Course, C. A. S., Fort Monroe, August 30.

1st Lieut. Orley D. Bowman, previous orders from 10th, Fort Adams, to 69th, Aberdeen Proving Ground, revoked.

1st Lieut. William I. Brady, from 11th, Fort H. G. Wright, to student, Battery Course, C. A. S., Fort Monroe, August 30.

1st Lieut. Howard E. C. Breitung, from student, C. A. S., Fort Monroe, to 6th, Fort Winfield Scott, upon completion of present course.

1st Lieut. Lathrop R. Bullene, from West Point, to student, Battery Course, C. A. S., Fort Monroe, August 30.

1st Lieut. William H. Burns, from 13th, Fort Barrancas, to Philippines, sailing New York, August 20.

1st Lieut. Walter H. Carlisle, from recruiting, Fort Sheridan, to 13th, Fort Crockett, June 25.

1st Lieut. James Bryce Carroll, from 12th, Fort Monroe, to student, Battery Course, C. A. S., Fort Monroe, August 30.

1st Lieut. Martin C. Casey, from student, C. A. S., Fort Monroe, to Hawaii, sailing New York, August 12.

1st Lieut. John F. Cassidy, from R. O. T. C., University of Minnesota, Minneapolis, to student, Battery Course, C. A. S., Fort Monroe, August 30.

1st Lieut. Harold J. Conway (Ord. Dept.), from student, Ordnance School, Watertown Arsenal, to Fort Sam Houston.

1st Lieut. Robert W. Crichlow, from 12th, Fort Monroe, to student, Battery Course, C. A. S., Fort Monroe, August 30.

1st Lieut. Frederick B. Dodge, Jr., from Hawaii, to student, Battery Course, C. A. S., Fort Monroe, August 30.

1st Lieut. Henry H. Duval, from 7th, Fort Hancock, to 52nd, Fort Hancock.

1st Lieut. Girville L. Field, from student, C. A. S., Fort Monroe, to 11th, Fort H. G. Wright, upon completion of present course.

1st Lieut. Karl C. Frank, from student, C. A. S., Fort Monroe, to 63rd, Fort MacArthur, upon completion of present course.

1st Lieut. Gerald G. Gibbs, from 7th, Fort Hancock, to 52nd, Fort Hancock.

1st Lieut. Edgar M. Gregory, from student, C. A. S., Fort Monroe, to Hawaii, sailing New York, August 12.

1st Lieut. Porter T. Gregory, from 12th, Fort Monroe, to Paris with pilgrimage of War Mothers, sailing New York, April 16.

1st Lieut. James L. Harbaugh, Jr., from Fort Monroe, to student, Battery Course, C. A. S., Fort Monroe, August 30.

1st Lieut. Donald B. Herron, from student, C. A. S., Fort Monroe, to 69th, Aberdeen Proving Ground, upon completion of present course.

1st Lieut. John I. Hincke, from 12th, Fort Monroe, to student, Battery Course, C. A. S., Fort Monroe, August 30.

1st Lieut. James L. Hogan, from recruiting, New York, to student, Battery Course, C. A. S., Fort Monroe, August 30.

1st Lieut. William G. Holder, from Panama, to student, Battery Course, C. A. S., Fort Monroe, August 30.

1st Lieut. David Hottenstein, from 12th, Fort Story, to student, Battery Course, C. A. S., Fort Monroe, August 30.

1st Lieut. James I. Howell, Jr., from 12th, Fort Monroe, to student, Battery Course, C. A. S., Fort Monroe, August 30.

1st Lieut. Frederick R. Keeler, to 12th, Fort Monroe, instead of 13th, Fort Barrancas, as previously ordered; from 12th, Fort Monroe, to student, Battery Course, C. A. S., Fort Monroe, August 30.

1st Lieut. George J. Kelley, from 13th, Fort Barrancas, to student, Battery Course, C. A. S., Fort Monroe, August 30.

1st Lieut. John O. Kelly, from Philippines, to headquarters, Ninth Corps Area, Presidio of San Francisco.

1st Lieut. David B. Latimer, from student, Battery Course, C. A. S., to student, Advanced Engineering Course, C. A. S., Fort Monroe, August 30.

1st Lieut. William S. Lawton, from student, C. A. S., Fort Monroe, to 61st, Fort Sheridan, upon completion of present course.

1st Lieut. Lyman L. Lemnitzer, from West Point, to student, Battery Course, C. A. S., Fort Monroe, August 30.

1st Lieut. George J. Loupret, from R. O. T. C., the Citadel, Charleston, S. C., to Hawaii, sailing New York, August 12.

1st Lieut. George W. MacMillan, from 18th Sound Ranging Battery, Fort H. G. Wright, to 11th, Fort H. G. Wright.

1st Lieut. Darwin D. Martin, from student, C. A. S., Fort Monroe, to 61st, Fort Sheridan, upon completion of present course.

1st Lieut. James E. McGraw, from 51st, Fort Eustis, to student, Battery Course, C. A. S., Fort Monroe, August 30.

1st Lieut. Ernest A. Merkle, from Hawaii, to 12th, Fort Monroe; from 12th, Fort Monroe, to student, Battery Course, C. A. S., Fort Monroe, August 30.

1st Lieut. Samuel H. Morrow, from Panama, to 51st, Fort Monroe.

1st Lieut. Joe D. Moss, from student Battery Course, C. A. S., to student, Advanced Motor Transport Course, C. A. S., Fort Monroe, August 30.

1st Lieut. Ola A. Nelson, from 7th, Fort Hancock, to student, Battery Course, C. A. S., Fort Monroe, August 30.

1st Lieut. George F. Nichols, from student, C. A. S., Fort Monroe, to 11th, Fort H. G. Wright, upon completion of present course.

1st Lieut. Arthur B. Nicholson, from 12th, Fort Monroe, to student, Battery Course, C. A. S., Fort Monroe, August 30.

1st Lieut. George W. Palmer, from 8th, Fort Preble, detailed in Ord. Dept. and to student, Ordnance School, Watertown Arsenal, July 3. Previous orders revoked.

1st Lieut. Douglas G. Pamplin, from 12th, Fort Monroe, to student, Battery Course, C. A. S., Fort Monroe, August 30.

1st Lieut. Robin B. Pape, from student, Battery Course, C. A. S., to student, Advanced Gunnery Course, C. A. S., Fort Monroe, August 30.

1st Lieut. John H. Pitzer, from student, C. A. S., Fort Monroe, to 12th, Fort Monroe, upon completion of present course.

1st Lieut. James G. Renno, from student, Signal School, Fort Monmouth, to student, Battery Course, C. A. S., Fort Monroe, August 30.

1st Lieut. William L. Richardson, from 12th, Fort Monroe, to student, Battery Course, C. A. S., Fort Monroe, August 30.

1st Lieut. Warren C. Rutter, from student, C. A. S., Fort Monroe, to recruiting, Denver, Colo., upon completion of course.

1st Lieut. Melicio M. Santos, P. S., from student, Q. M. C., Motor Transport School, Holabird, to Philippines, sailing New York, August 20.

1st Lieut. Clarence H. Schabacker, to sail New York September 27 for Hawaii, instead of July 18, as previously ordered.

1st Lieut. Lloyd Shepard, from student, C. A. S., Fort Monroe, to 69th, Aberdeen Proving Ground, upon completion of present course.

1st Lieut. Logan O. Shutt, from West Point, to student, Battery Course, C. A. S., Fort Monroe, August 30.

1st Lieut. Perry McC. Smith, from Fort Monroe, to West Point, August 25.

1st Lieut. Raymond Stone, Jr., from 12th, Fort Monroe, to West Point, August 25.

1st Lieut. Maxwell W. Tracy, previous orders to West Point revoked.

1st Lieut. Donald C. Tredennick, from student, C. A. S., Fort Monroe, to 51st, Fort Monroe, upon completion of present course.

1st Lieut. Gustave H. Vogel, detailed in Q. M. C. and to Q. M. C. Motor Transport School, Holabird. Previous orders revoked.

1st Lieut. Everett C. Wallace, from student, Battery Course, C. A. S., to student, Advanced Engineering Course, C. A. S., Fort Monroe, August 30.

1st Lieut. William H. Webb, from 9th, Fort Banks, to student, Battery Course, C. A. S., Fort Monroe, August 30.

1st Lieut. Charles W. West, from student, C. A. S., Fort Monroe, to Panama, sailing New York, August 7.

1st Lieut. Charles M. Wolff, from U. S. A. M. P., Schofield, to student, Battery Course, C. A. S., Fort Monroe, August 30.

1st Lieut. Michael H. Zwicker, from 6th, Fort Winfield Scott, to Paris with pilgrimage of War Mothers, sailing New York, April 16.

2nd Lieut. Harold A. Brusher, from Philippines, to 69th, Aberdeen Proving Ground.

2nd Lieut. Clair M. Conzelman, from Philippines, to 11th, Fort H. G. Wright.

2nd Lieut. Carl A. Dutton, from detail in Ord. Dept., and from Watertown Arsenal, to West Point, August 25.

2nd Lieut. Edward C. Franklin (Ord. Dept.), from Aberdeen Proving Ground, to Ordnance School, Watertown Arsenal, June 30.

2nd Lieut. Carl W. Holcomb, from Philippines, to West Point, August 25, instead of to 14th, Fort Worden, as previously ordered.

2nd Lieut. Armand Hopkins, from student, Paris, France, to West Point, August 25.

2nd Lieut. William E. House (Ord. Dept.), from student, Ordnance School, Watertown Arsenal, to Raritan Arsenal for a course of instruction, thence to Aberdeen Proving Ground June 28.

2nd Lieut. John W. Huyssoon, from 14th, Fort Worden, to Hawaii, sailing San Francisco, July 9.

2nd Lieut. Paul A. Jaccard, from Hawaii, to 62nd, Fort Totten.

2nd Lieut. William F. McKee, from 13th, Fort Barrancas, detailed in Air Corps and to Brooks Field, July 1.

2nd Lieut. Jacob G. Reynolds, from 3rd, Fort MacArthur, detailed in Air Corps and to student, A. C. Primary Flying School, Brooks Field, July 1. Previous orders revoked.

2nd Lieut. Holger N. Toftoy, from Hawaii, to West Point, instead of as previously ordered.

Warrant Officer Louis R. Miranda, band leader, 1st C. A. Band, Fort deLesseps, retired.

Mast. Sgt. William F. Cooper, 13th, Fort Barrancas, retired.

Mast. Sgt. William Gartz, 64th, Fort Shafter, retired.

Mast. Sgt. William E. Mapes, office of Chief of Coast Artillery, retired.

Mast. Sgt. John McGowan, 59th, Fort Mills, retired.

Tech. Sgt. Charles J. Dougherty, 62nd, Fort Totten, retired.

1st Sgt. Howard D. Anthony, 65th, Fort Amador, retired.

1st Sgt. George H. Bobden, 13th, Fort Barrancas, retired.

1st Sgt. Walter W. Garriss, 13th, Fort Barrancas, retired.

1st Sgt. Thomas P. Maher, 8th, Fort Preble, retired.

1st Sgt. Martin F. Melia, 16th, Fort Ruger, retired.

1st Sgt. Stanley Millard, 8th, Fort Preble, retired.

Private Fred H. Dirks, from 13th, Fort Crockett, to 69th, Aberdeen Proving Ground.

Private William J. Moulton, 6th, Fort Baker, retired.

### *NEW UNIFORMS FOR R. O. T. C. UNITS*

*The senior units of the Reserve Officers' Training Corps will soon be provided with an improved uniform which has been approved by the Secretary of War. All of these uniforms, of sixteen-ounce olive drab melton, will be brand new, and are now being manufactured by the Quartermaster Corps from cloth purchased for this purpose. Effort is being made to effect complete delivery of these uniforms by September of 1930.*

*Advanced students who are Cadet Officers will wear Sam Browne belt, service cap, leather leggins, etc., and basic students will wear uniforms similar to those of enlisted men of the Army, with service or overseas caps. The uniform of each basic student, however, will differ materially from the enlisted man's uniform and from that of the Advanced students, in that lapels of the coat will be faced with sky blue material.*

*Various colors were considered for these lapels, but the color chosen was believed to present the best appearance.*

# BOOK REVIEWS

*Introduction to Military History.* By Robert Greenhalgh Albion, Ph. D. New York: The Century Co. 1929. 5″ x 6½″. 429 pp. Ill. Maps. $2.25.

For years the Reserve Officers' Training Corps has included in its program a course of instruction in the military history and policy of the United States. For this course there has been no single volume which could be considered suitable as a text book upon which the instructor might base illustrative lectures. Instead, it has been necessary for the lecturer to attempt such an outline of the subject as would give to the student a synchronization of events upon which illustrative research could be based. In recognition of the unsatisfactoriness of such an arrangement, three books devoted to the subject of military history have recently appeared.

Professor Albion, calling his work an "introduction" to military history, writes from the experience of three years of lectures before the R. O. T. C. Unlike the other authors, he recognizes the fact that an appreciation of military events requires a background. He therefore starts with an account of the development of arms and armies, tracing briefly the history and development of weapons from the pre-historic stick and stone to the long-range weapons of today. He traces armies from the tribal units of early days through the independent companies and mercenaries of later time to the huge units we saw in the recent war. Considerable space is devoted to a discussion of the "professional" army system of England and the United States, as contrasted with the "amateur" system of most European countries.

The second section of the volume includes two chapters in which the American military policy is discussed. Six chapters cover, all too briefly, American wars and campaigns. An Appendix makes suggestions for campaign reports, gives an extensive bibliographical list, and reprints the National Defense Act of 1920.

It is extremely difficult to compress into the time available an adequate discussion of the military history of the United States. It is extremely easy to criticize the material selected by any one lecturer for use in such a brief course. The problem is largely one of elimination. There is ample source material and choice might range from a detailed discussion of a very limited number of battles or campaigns to an outline of our complete history with few or no detailed accounts. Professor Albion has selected the latter method as best serving the instructional program.

In stating that our "usual inland forts have been western frontier posts built for protection against the Indians," Professor Albion overlooks such forts as Ontario, Niagara, Wayne, and Michillimackinac. In correctly dating the "renaissance" of the Army as 1881, he mentions the establishment of the School of Application for Infantry and Cavalry as "the rudimentary beginning of the extensive system of army schools" maintained at present, neglecting the fact that the Artillery School, which had been established in 1824, had, in 1881, been in uninterrupted operation since the close of the Civil War, and overlooking the first Infantry School established in 1826. Genghis Khan is placed in the second rank among great military leaders, although he was the only one of the "world conquerors" whose empire withstood the shock of his death. Tamerlane is not mentioned as among the great or near great. Grant is rated only as "good" and his strategical ability is not specifically mentioned.

In the section devoted to battles and campaigns, Trenton and Princeton receive an entire chapter. These two battles mark a turning point, "second in importance only to Saratoga." They are emphasized as illustrating Washington's strategy at its best. The importance of this critical period in American

affairs justifies the emphasis. The revivifying effect upon American morale was probably all that made Saratoga and, ultimately, Yorktown possible.

Concerning the Saratoga campaign, the author says: "The British, meanwhile, wanted to secure the line of the Hudson and so cut off New England." According to Professor Van Tyne, who is supported by Professor Channing, there is nothing in available documents to indicate that there was any thought of "cutting off" New England, although that would be the logical result of successful operations along the Hudson. The author says further: "Many historians state that the British planned a threefold campaign in which Howe was to come up the Hudson, joining Burgoyne and St. Leger at Albany, with the colonies thus cut in two . . . no such triple plan was ever adopted." In substance, except for cutting the colonies in two, this was the plan, but Howe went to Philadelphia instead of up the Hudson. So it should be made clear that when Clinton "failed to relieve Burgoyne" he made the attempt, although it was not altogether his place to do so with the small force available. It was Howe who failed to relieve Burgoyne, in that he failed even to make the attempt.

Like the other recent authors, Professor Albion does not appear to consider the peace-time influence of the Army upon the economic development of the nation as a part of our military history. As a rule, nations are born and nations die through military operations. Whether for good or evil, the military exerts an influence in times of peace. This has been particularly true in our country and the "things the Army does besides fight" should be pointed out.

Lest we should seem unduly critical, it should be repeated that these criticisms cover only minor points. Professor Albion has prepared an excellent introduction to American military history which should be of value in the general orientation of any student preparing to take up any phase of our campaigns and battles. Of great importance is the bibliographical list of military books and the analytical discussion accompanying it. With this volume as a starting point and a guide to future study no student need go astray nor waste his time on unimportant works.—R. A.

*Dreamers of Empire.* By Achmed Abdullah and T. Compton Pakenham. Illustrated by B. K. Morris. New York: Frederick A. Stokes Co. 1929. 5¾" x 8½". 368 pp. $3.50.

Adventure; glorious, romantic adventure in strange, out-of-the-way places, is told in a most colorful and entertaining manner by Achmed Abdullah and Mr. Pakenham. Most of the adventures are in the Orient, which guarantees a sympathetic and intelligent treatment from the first named collaborator, whose short stories in Oriental subjects are so widely read.

The lives of six men are sketched in this book; five British—Cecil Rhodes, the Empire builder; Sir Richard Burton, the Orientalist; John Nicholson and Sir Henry Lawrence, heroes of the Indian Mutiny and "Chinese" Gordon—and one American, William Walker, the Central American filibuster. With the possible exception of Rhodes not one of these names is a household word in America, and even Rhodes is best known now for his Oxford scholarships, rather than for his own achievements. Yet all did great things. Perhaps some were not successful, judged by worldly standards, but all were essentially men of initiative and action, of independent thought and original ideas, who advanced the cause of civilization.

Being adventurers, it is hardly surprising to find that only one of six ever married, and it was not until he was forty and had already achieved the great things of his life that Richard Burton led a wife to the altar. "He travels best who travels alone" was the motto of all.

Burton, Nicholson and Lawrence were all in the army of the old East India Company. Gordon was an engineer officer in the regular British establishment. Walker was a soldier of fortune in the true sense of that term. While never donning a uniform Rhodes accompanied many military expeditions during the British expansion in South Africa. Yet, with it all, Walker, the American, was the only one who could be properly characterized as a militarist. All five Englishmen were essentially men of peace, men who fought in order to make the world a better place in which to live, and who, while fighting, dreamed of peace. Those are the true pacifists.

Rhodes dreamed of an Africa all colored red on the maps as British territory and a Cape to Cairo railway, yet he resorted to arms only when peaceful methods failed and his famous scholarships were founded for the purpose of securing a better international understanding to help the cause of peace. His dream has now come true.

Probably the early career of Richard Burton was the most colorful and entertaining of the six. He is best known today from his inimitable translation of the Arabian Nights, the one always referred to in the advertisements as an "unexpurgated edition," but in his own day his fame rested principally on his wonderful trip, disguised as a Moslem Pathan, to the holy places of Islam. The first white man to set foot in the Holy of Holies at Mecca, he literally carried his life in his hands for many months. This tale is told in such a vivid manner that one breathes the spirit of Islam as he reads and needs no imagination to hear the muezzin's daily call to prayer. Burton "dreamed in seventeen languages," most of us have only nightmares in one.

John Nicholson was a remarkable man. All who have lived in the Far East remember the Sikh police and watchmen with respect and admiration, but how many know that it was a lieutenant, twenty-eight years old, named John Nicholson, who turned the Sikhs from fierce, implacable enemies to a race "passionately loyal to the Union Jack—proving this loyalty over and over again." Nicholson was only thirty-six when he was killed in the Mutiny, while a temporary brigadier general.

Sir Henry Lawrence was also killed in the Mutiny, during the famous siege of Lucknow, and the lives of Nicholson and Lawrence, as told in this book, will give the reader an excellent picture of the political condition of India in the days of the old John Company, a truly adventurous period.

Gordon was above all else a Christian. A hard and stern disciplinarian, his dreams were of the Christ, whether in the Crimea, that shining example of Anglo-Saxon military inefficiency, in China at the head of his "ever-victorious army" or in the Soudan, where he met his death at Khartoum, a victim of "Little Englanders," whose counterparts are with us in America. Throughout his career Gordon suffered from "that sloppiness and unpreparedness which is the bane, and for some unknown psychological reason the pride and glory of Anglo-Saxon democracy—be it a democracy flattered and soft-soaped by a king or bullied by a president." It is a healthy sign when civilian authors can write such words.

William Walker, the American, was a totally different character. Here shone the soldier of fortune in his brighest colors, fighting for fighting's sake was his motto. First he was intrigued by Lower California and endeavored to create it into an independent country, headed by William Walker. Then came Nicaragua. He engineered revolutions in that country, became its President, but was driven out. Back again and another failure. Then he turned to Honduras and tried the same tactics, but lost his life in the attempt. It is a pity

that his energy and talents could not have been employed to better advantage, but his story is interesting and well told in this book.

No lover of romance and adventure will regret reading this delightful volume.—R. E. W.

*Commando.* By Deneys Reitz. New York: Charles Boni. 4¾" x 7¼". 313 pp. Paper, 50 cents. Cloth, $1.50.

It is seldom that literary critics can agree as to the merits of a book; but the authors of the many reviews of "Commando" that have appeared recently unite in giving this book a place among the greatest stories of true personal adventure ever written.

"Commando" is a journal of the Boer War; and although written in Madagascar in 1903, the year following the close of that war, when the details of the tragedy were still vivid in the mind of the young soldier author, it was printed for the first time in January, 1930, as the choice of the "Paper Book of the Month Club" for the first month of the new year. That fact will explain why the price of the volume gives no indication of its worth.

Gen. Jan C. Smuts, under whom the author of "Commando" served during the latter part of the Boer War, has written the foreword; and in an eloquent paragraph he gives a just estimate of what the book must mean to any reader. To quote from General Smuts: "Here is the book of the Boer War for which I have been waiting for twenty-five years and more. Many military books have been written on the Boer War—books full of interest and of valuable material for the future historian, but something more was wanted. The Boer War was more than a mere war. It was a vast tragedy in the life of a people whose human interest far surpassed its military interest. A book was wanted which would give us some insight into the human side of this epic struggle between the smallest and greatest of peoples. Here we have it at last. There is no strategy and little tactics in this plain, unvarnished tale. Wars pass, but the human soul endures; the interest is not so much in the war as in the human experience behind it."

When Francis William Reitz, former President of the Orange Free State and Secretary of State under President Paul Kruger, sent an ultimatum to the British giving them two days to withdraw their troops from the frontiers of the Boer Republics, his son Deneys, author of "Commando," was seventeen years old. When England accepted the challenge and war was officially declared in October of 1899, Deneys Reitz and his brother, Joubert, eighteen years old, were with the picturesque army of seventy thousand horsemen that rode out to invade British Natal. From that day until the close of the war young Reitz was continually in the field, and every page of his journal gives an unforgettable picture of one of the most desperate struggles for freedom ever waged by a sturdy and liberty-loving people.

Joined by two more brothers—Hjalmar, recalled from school in Europe, and Arnt, only sixteen years old, Deneys Reitz helped to drive the British into Ladysmith and took an active part in the siege. He was in the thick of the famous battle of Spion Kop; and when General Buller succeeded in relieving Ladysmith, broke the Tugela line of defense and pushed the Boers back, young Reitz rode with the handful of rear guard horsemen who day after day delayed the British advance by skirmish fighting in order to give the main Boer army time to escape with the wagons. When the Boer retreat became a rout; when Johannesburg and Pretoria were captured and General Botha had only a few hundred troops left; when the British believed the Boer resistance at an end

Deneys Reitz was with the Boers who escaped into the hills and carried on the war by the only possible method—guerrilla tactics.

Of absorbing interest from the first page, this is the point in "Commando" where the narrative becomes so breath-taking, so filled with adventure and narrow escapes that it is difficult for the reader to put the book down. And in the face of this, General Smuts, who knows the facts, says in his preface: "It is a true story, and the facts are often understated rather than exaggerated. The exciting incidents, the hair-breadth escapes, the dare-devilry are literally true, and the dangers he passed through and courted are such as to make his unvarnished record read like one of pure romance."

Operating in small units, swooping down from the wild hill country to attack British outposts or bodies of troops on the march, escaping back to the hills with their booty and living as best they could on what they could forage from the country, Deneys Reitz and his companions led hard and dangerous lives. At one time he remarks: "By this time my clothes had fallen from my body, owing to the rains, and my entire wardrobe consisted of a blanket and a pair of sandals, so that, as it was toward the end of March by now, with winter coming on, I felt the cold pretty severely." Hjalmar was captured and sent to India; Joubert, too, was taken by the British and sent to Bermuda. The elder Reitz was with the government laager which was moved from place to place as the British advanced—literally a mobile administration.

At last the British decided to march great numbers of troops across the country like a drag net; burning the farms, destroying the crops, killing the domestic animals and driving the non-combatants into concentration camps, where they were destined to die by the thousands of epidemic. The Boer troops, from the tops of the hills, watched this great drive and saw their country laid waste. As has been the case in all history, any attempt to terrorize a brave enemy only serves to stiffen their resistance. Deneys Reitz says, "This policy, instead of shortening the war, prolonged it by a year or more." But it is a noteworthy fact that "Commando" is not written in a bitter vein. Young Reitz says that the English were always courteous and honorable. The Boers never hesitated to allow their sick and wounded to fall into the British hands, knowing they would be given care and food that they themselves were unable to give. In discussing an incident that occurred near the close of the war, young Reitz says of an English officer involved: "He was the only disagreeable Englishman whom I met in the war, for with this one exception I had no unpleasant word from officer or private in all the time we were out against them."

In 1901, cut off from the commando of General de la Rey, with which he had been fighting, Deneys Reitz decided to ride south and attempt to cross over the border into Cape Colony, where he had heard that bands of Boers were still in the field. After almost incredible hardships and difficulties, he and his ten companions, all of whom were afterward either killed or captured, met up with a commando under Gen. Jan Smuts, bound for a flying raid into Cape Colony. With this band of three hundred heroic men young Reitz entered the Cape and for five months he lived in the saddle; cornered again and again but always escaping unhurt; riding sixty hours at a stretch in sleet that froze his rags of clothing to his body; cut off from General Smuts for several weeks and winning though by sheer fearlessness, hiding in the day time, traveling at night and living as best he could. It is an historic fact that this little handful of resolute men under General Smuts routed several large detachments of British troops, captured camps and wagon trains and took over Cape Colony from the Olifants to the Orange River. They were investing the mining center of O'Okiep when a

dispatch bearer from Lord Kitchener came to General Smuts under a flag of truce, summoning him to a peace conference to be held in the North Free State. General Smuts took young Reitz with him and when the young soldier saw the representatives who had come in to the conference from the northern commandos he knew the war was over. "Nothing could have proved more clearly how nearly the Boer cause was spent than these starving, ragged men, clad in skins or sacking, their bodies covered with sores from lack of food and salt. . . . Their spirit was undaunted, but they had reached the limit of physical endurance. . . . Added to this was the heavy death toll among the women and children, of whom twenty-five thousand had already died in the concentration camps, and the universal ruin that had overtaken the country. . . . There was nothing left but to bow to the inevitable."

The elder Reitz signed the peace treaty as Secretary of State of the Transvaal but not as a private citizen, so he was deported; and his sons, Deneys and Arnt, followed into self-imposed exile, going to Madagascar. It was while in exile there, "eking out a living convoying goods by ox-transport . . . hard work in dank fever-stricken forests, and across mountains sodden with eternal rain" that "Commando" was written.

A letter from Mrs. Smuts came to Deneys Reitz in Madagascar and made him realize that it was his duty to return to his own land and to serve his people under the new flag as his forefathers had served them under the flag of the Republics. "The loyalty of the Boer boy ripened into the broader loyalty of the South African," and General Smuts in his preface gives us interesting facts as to the later career of Deneys Reitz. "He served on my staff in the German West campaign (of the World War) just as he had done in the Boer War; in the German East campaign he rose to command a mounted regiment, and in the later stages of the Great War he commanded the First Royal Scots Fusiliers, one of the oldest regiments in the British Army. He was severely wounded early in 1918, but returned to France in time to lead his battalion in the fierce battles that closed the great drama and after the armistice he led his men to the Rhine. . . . Since the war he has been a Cabinet Minister and still is a Member of Parliament in which capacity he is serving under me as loyally as he did in the sterner days of which he writes."

Notwithstanding the successes and honors that have come to Colonel Reitz in his later years, there can be no part of his career in which he may feel a more justifiable pride than in this splendidly written record of his young manhood's devotion to a lost cause.

A discussion of "Commando" would not be complete without calling attention to the marked difference in the mental attitude toward war shown by the author of this book and the authors of most of the recent books dealing with personal experiences in the World War.

In "Commando" there is no coarse jesting at tragedy; no bitter hatred of the enemy; and particularly none of that half-hysterical, wholly-morbid, self-pitying sentimentality that cannot be associated with a sane mind in a healthy body. Deneys Reitz, soldier—steadfast, quiet and brave, faced a man's job with determination; giving the best possible account of himself in every emergency, finding no time to moralize or sentimentalize. It is plain he felt it not only a duty but a privilege to serve his country with a high loyalty and a passionate devotion. The whole atmosphere of "Commando" is essentially wholesome. Deneys Reitz and his companions remind us of that breed of men who fought our own Revolution and tamed our own frontiers. One wonders if pink propaganda and Utopian dreams are making the breed extinct. E. L. B.